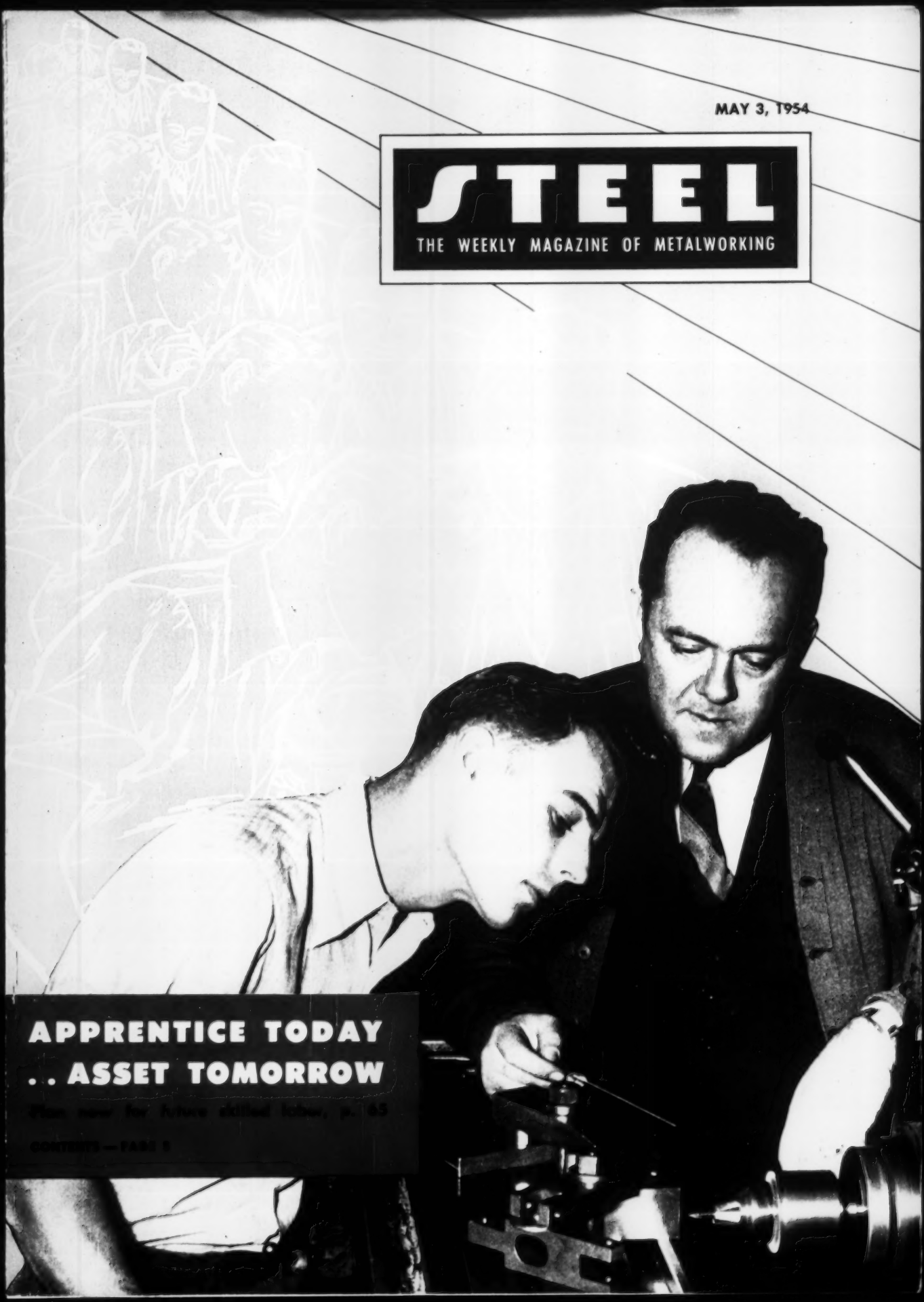
MAY 3, 1954

STEEL
THE WEEKLY MAGAZINE OF METALWORKING



APPRENTICE TODAY .. ASSET TOMORROW

Plan now for future skilled labor, p. 65

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consider:

Corrosion Resistance and Analyses

As chromium and nickel provide corrosion resistance in stainless steel, it follows that 18-8, 18-8 Cb, 18-8 ELC and 18-8 Ti, having similar chromium and nickel content, should have the same corrosion resistance. Exposure in certain types of service, however, may prove otherwise.

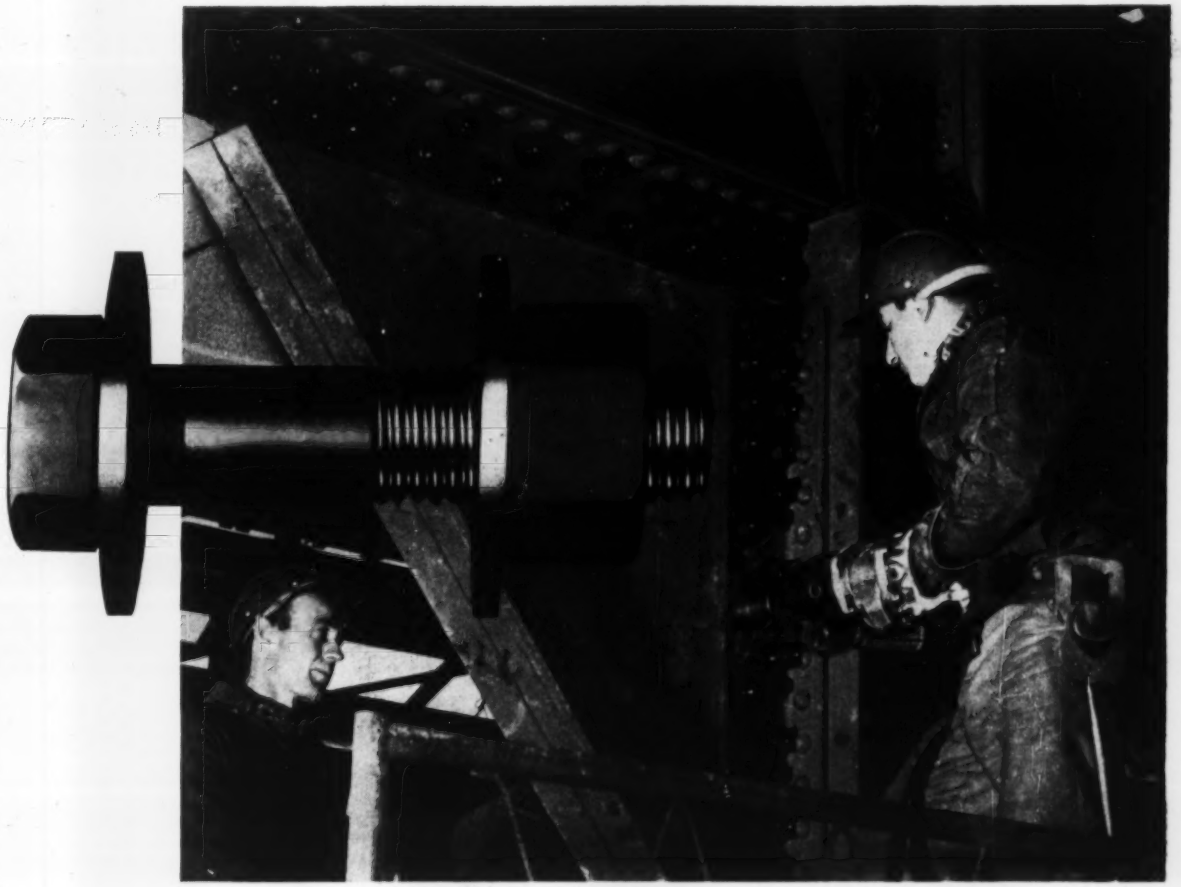
If tubing of these materials is field welded without subsequent heat treatment, or operated intermittently at high temperatures, there will be a difference in corrosion resistance. The 18-8 grade may lose its corrosion resistant properties while the other three grades maintain theirs. This is because of slight differences in chemistry—5 parts in 10,000 in carbon content or the addition of 5 to 7 parts in 1,000 of columbium or titanium. Thus, your particular end use service condition, in addition to the basic cost of materials, should dictate which grade to use.

For virtually any application—pressure or mechanical—B&W can provide either seamless or welded stainless tubing in any number of grades, in a broad size range. Help in obtaining the best stainless tubing for your applications is available through B&W Regional Sales Offices and a nationwide network of experienced tubing distributors. Mr. Tubes—your link to B&W—will be pleased to furnish detailed answers to your stainless tubing problems.

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

B&W
SEAMLESS and WELDED
TUBES

TA-1812(SSP)



JOBS GO UP FAST *with* HIGH-STRENGTH BOLTS

Steel erection moves along faster when you join structural members with Bethlehem High-Strength Bolts, instead of field-driven rivets.

Bethlehem High-Strength Bolts save erection time because they can be installed by two men using a holding wrench and a pneumatic impact wrench. The hexagonal-head bolts are used with two hardened washers, one placed under the head, the other under the hexagonal nut. Tightening can be accomplished in from 5 to 10 seconds per bolt, to obtain maximum clamping force.

Bethlehem High-Strength Bolts are made of carbon steel, in diameters from ½ in. to 1¼ in., and in varying lengths. They are heat-treated by quenching and tempering to meet the requirements of ASTM Spec. A-325.

For full information about how Bethlehem High-Strength Bolts can help speed your construction work, get in touch with the nearest Bethlehem sales office.

MECHANICAL PROPERTIES OF BETHLEHEM HIGH-STRENGTH BOLTS

Bolt Diameter	½ in.	⅞ in. and 1 in.
Brinell Hardness	241 to 302	235 to 302
Min. Tensile Strength, psi	120,000	115,000
Min. Proof Load, psi	85,000	78,000

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

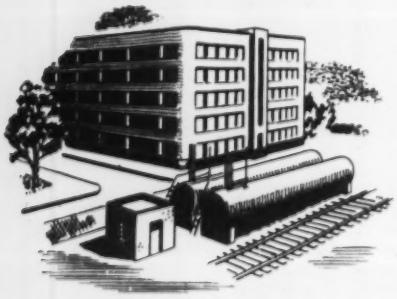
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

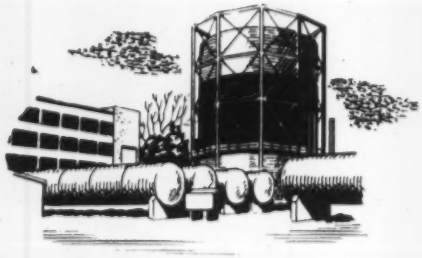
BETHLEHEM STEEL

America's Largest Selling Brand of LP-Gas

PHILGAS*!

CLEAN, UNIFORM HEAT FOR INDUSTRIES AND UTILITIES





PHILGAS BENEFITS: This top-quality Phillips *66* butane-propane fuel is uniform in thermal value and gravity. Free from harmful contaminants, it burns *clean!* Automatic operation cuts down on overhead, assures constant furnace temperatures, atmospheres and pressures.

PHILGAS USES: Leading industries use Philgas successfully for heat treating, mold drying, core baking, ceramic firing and many other operations. Many progressive utilities also find it advantageous to augment their natural or manufactured gas output with clean-burning, reliable Philgas.

*Philgas is the Phillips Petroleum Company trademark for its high quality propane-butane LP-Gas or bottled gas.

Philgas
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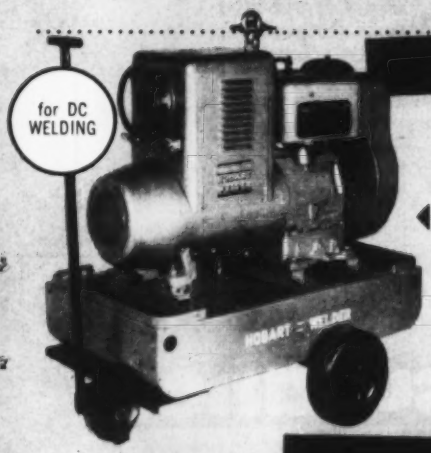
Offices located in Amarillo, Tex., Atlanta, Ga., Chicago, Ill., Denver, Colo., Des Moines, Ia., Pontiac, Mich., Indianapolis, Ind., Kansas City, Mo., Milwaukee, Wis., Minneapolis, Minn., New York, N. Y., Omaha, Nebr., Raleigh, N. C., St. Louis, Mo., Tulsa, Okla., Wichita, Kans.

For WELDING Only

For AC POWER or AC WELDING

HOBART *offers a model to meet your special requirements*

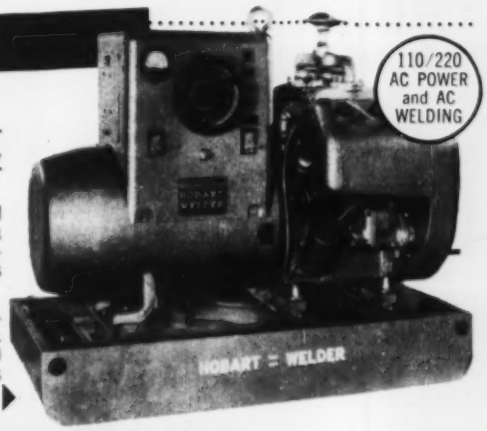
AIR COOLED



For the profitable outside jobs and emergency repair work where light weight, speed and low cost operation are essential in getting the big pay jobs.

"HUSKY BOY"—a 200 amp. DC air cooled gas engine welder for equipping a quick action lightweight service truck. A compact, low investment unit with features for modern welding requirements.

AC POWER—AC WELDER—AIR COOLED—This single unit serves two purposes. Furnishes power for welding or 110/220 power for running motors, lights, tools and other electrical accessories.

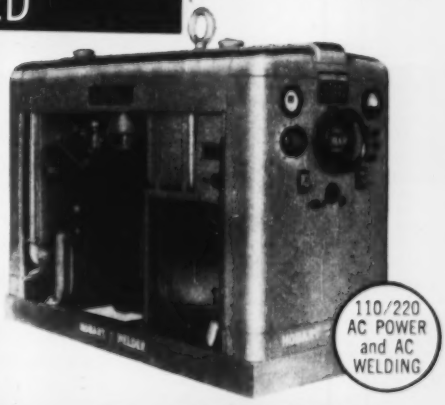


or WATER COOLED

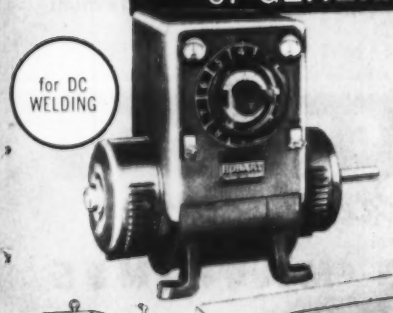
Hobart's complete line of welding equipment permits you to select just the right unit and size for your particular work. Equipment that is designed with special built-in features.

DC WATER COOLED – Gas engine driven welders with Remote Control, Self-starting and Dual Control, making possible 1000 combinations of welding heat are but a few of the many extras you get in Hobart.

AC POWER—AC WELDER—WATER COOLED—for general service or emergency use. For contractors, and others where operation may be carried on independent of electric power lines. As a welder, or runs motors, lights, tools, grinders, compressors, pumps, etc.



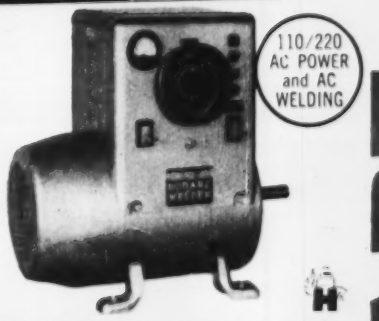
or GENERATOR ONLY for use with your own power



Now you can have the same advantages of welding and power units in a generator only that lets you quickly and easily belt or couple the unit to your own power source.

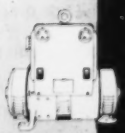
FOR DC WELDING – this generator only is ideal for building your own portable gasoline engine driven welder, by means of direct coupling to a gas engine or by means of power take off.

AC POWER—AC WELDER GENERATOR ONLY—with minimum investment you can supply your own power and have all the advantages of Hobart revolutionary AC-AC combination. Can be taken to the job for welding or used as electrical power source in the field.



ELECTRIC MOTOR DRIVEN

AC TRANSFORMER



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Hobart No. 10—Your Best General Purpose Electrode

Right down to the stub—this Hobart No. 10 electrode gives more welding ease and efficiency. An all-position fast DC electrode, with a stable, deeply penetrating arc . . . deposits a smooth, flat bead of high tensile strength and ductility. Send for FREE samples.

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Please send information on the items checked below:

_____ Amp. Capacity. ☐ Portable ☐ Stationary
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☐ DC Welder Generator Only ☐ AC Power-AC Welder Gen. Only
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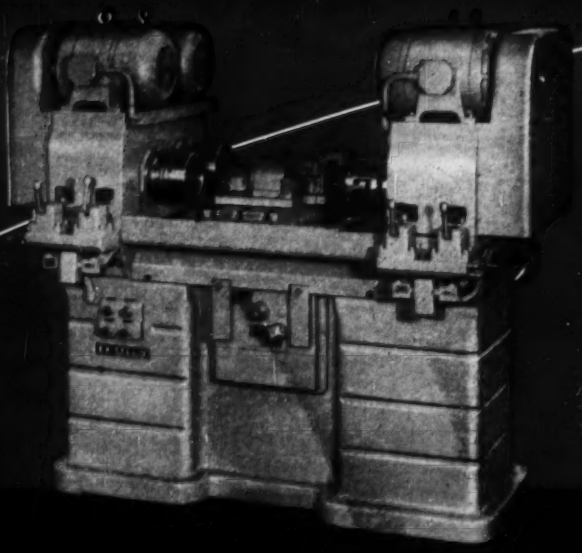
HOBART WELDERS, ELECTRODES



XLO
EX-CELL-O for PRECISION

STYLE 1212-A. For identical or different operations at each end. When loading time of parts approximates the time of machining, a double-end machine practically doubles production capacity.

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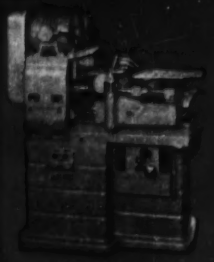
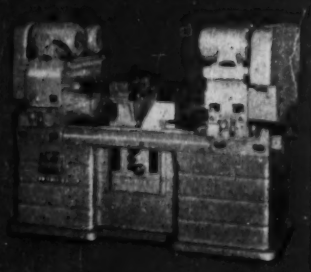
when you replace obsolete equipment with these MODERN COST-SAVING MACHINES



STYLE 2112-A. Single-end model for workpieces in the small and medium-size range. Flexible hydraulic controls give easy adjustment of multiple operations.

STYLE 112-C. Large and sturdy with long stroke. Accommodates medium and heavy work, gives maximum precision production, minimum operating cost.



STYLE 17. Massive construction. Maintains the highest precision standards on a profitable production basis. Economical in operation, can be set up for variety of jobs.

With this versatile equipment, you can precision bore, turn, face, counterbore, chamfer, and groove.

These machines are standard, yet they'll handle a large variety of precision operations. Ex-Cell-O also has the standard items of tooling to make this possible at minimum cost.

These fast, sturdy, flexible Ex-Cell-O machines are *profit insurance*. For years to come they will keep on turning out *precision work at maximum production speeds.*

EX-CELL-O
Precision
BORING MACHINES

Get all the facts about them from your local Ex-Cell-O representative, or write for a Precision Boring Catalog.

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MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING SPINDLES
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This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 134 No. 18 May 3, 1954

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Editorial, Business Staffs—16. Advertising Index—182. Editorial Index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

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(Advertisement)

what's NEW in Engineering

A new, fast coupling for simplifying connections of tubing or piping, regardless of the size or purpose, is said to need no threading, flares, ferrules or tools to make the connection. A spring clip is pressed, the tubing is inserted, the spring is released and the connection has been made in one quick operation.

Sticky to dry bauxite in 13 miles and how to handle it effectively at both ends was just one problem facing Kaiser Engineers in developing mining facilities in

Jamaica. Self-heating truck bodies and other specially designed handling methods licked this problem. At the same time, the versatile talents of Kaiser Engineers were focused on all other facilities at the island mine: housing, drying, storage, a 995-foot dock, 13 miles of railroad and a 1,000 ton-per-hour conveyor loading system being just a few of them.

Chemical Business Handbook, just published, is the title of a valuable new book edited by John H. Perry. It is a reference book of modern business management keyed especially to the needs of the chemical and chemical engineering industries.

When it comes to research, preliminary engineering studies, engineering design and layout, estimating, preparation of specifications, construction programming, negotiation of contracts, and procurement and expediting of materials and equipment – call or write: Kaiser Engineers Division of Henry J. Kaiser Company, Kaiser Building, Oakland 12, California.

behind the scenes

Two-time Loser?

The long arm of the law reached into the Penton Building one day last week and tapped heavily upon the shoulder of John Morgan, STEEL assistant managing editor. Being a convicted jaywalker with a $5.00 fine already on his record, Morgan felt himself a twentieth century Jean Valjean with his loaf of bread showing.

What did the FBI want? Well, someone had been pilfering the U. S. mail and, in the particular mail bag that had been stolen and later recovered, was one of STEEL's Quarterly Survey questionnaire forms. This, of course, had John Morgan's signature on it. The detective was merely returning the letter in person in order to check on whether its contents were still intact.

Morgan heaved a sigh of relief and the unanswered questionnaire into the wastebasket. The officer would not permit himself to be quoted on the status of the metals market for the second half of 1954.

At Limbo

Every once in a while, our fingers, mind and typewriter have a particularly difficult time co-ordinating. Words become illusive—ideas nonexistent. At times like these, we are reminded of a lament of a sorry soul in much the same predicament as we.

I want an odor-proof, motor-proof car,
And a shock-proof, hock-proof watch,
And a fray-proof, fade-proof star,
And some water-proof, lotta-proof Scotch.

I want a dun-proof, run-proof spouse,
And a debt-proof place to dwell—
Not this shatter-proof, rust-proof sound-proof, dust-proof, fool-proof padded cell!

Cover Pic

This week's cover photo is the kind that makes you want to swing back in your superupholstered chair, put your newly shined Florsheim's on the desk top and say, "Now when I was a youngster starting out in this business, we never had it so good. Fortunately, I had the talent, the ambition, the stick-to-it-iveness. . . ."

Pardon us for interrupting, but we want to take a minute here to thank Mr. Theodore Haas, director of training at Thompson Products Inc., Cleveland, for letting us use that particular photograph. Men like Mr. Haas are largely responsible for the youngster today getting that better break at job training.

One of his very pleasant assignments, he tells us, is to visit high schools in the northeastern Ohio area and discuss the benefits of apprenticeship training with students soon to graduate. Here is a man who can speak with authority for he is a product of the very school he now directs.

We're Starched

For approximately two years now, we on STEEL have employed the services of Daniel Starch and Staff, consultants in business research, to conduct personal interviews among our readers for the purpose of providing advertisers and their agencies more factual information with which to evaluate the readership of their advertising messages in STEEL.

Another valuable purpose of the Starch reader interviews is to furnish our editors a continuing measurement of reader interest in the magazine's editorial content. This helps to keep them constantly aware of your needs and permits them to provide the type of information you can put to most practical use in the performance of your jobs.

If a Starch researcher has already called upon you, we want to thank you for the time and information you gave him. If a Starch researcher calls upon you sometime in the future, please know that he is taking a few minutes of your valuable time to help us help you through the pages of STEEL magazine.

Shrdlu

(Metalworking Outlook—Page 47)

KX-99

PROVED IN SERVICE

15 LEADING STEEL COMPANIES USE A. P. GREEN KX-99

CHECK THESE OUTSTANDING PROPERTIES OF KX-99

1. Special high fired, Missouri super duty fire-clay brick.
2. No sign of carbon monoxide disintegration in 1000 hour test at 900° F.
3. Apparent porosity in the range of 8 to 12 per cent with an average of 10 per cent.
4. Bulk density in the range of 2.30 to 2.40 grams per cubic centimeter.
5. Average modulus of rupture 1800 to 2500 pounds per square inch.

KX-99 Blast Furnace Brick are manufactured to extremely close tolerances . . . uniform in dimensions . . . free from warpage.

A. P. Green REFRACTORY PRODUCTS

KX-99 Blast Furnace Brick are recommended for Complete Blast Furnace linings, Hot Metal Mixers and Hot Metal Cars. They were developed to meet the service requirements in the Steel Industry. They resist carbon monoxide disintegration, slag action, chemical action and abrasion.

For detailed information on service and specific recommendations—contact your local A. P. Green Representative or write

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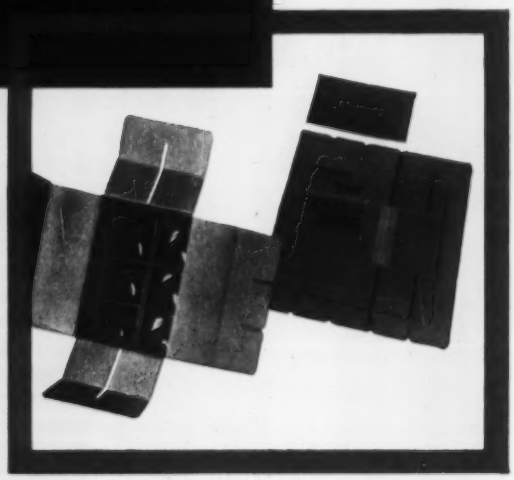

SLASH packing time

Write for free booklet, "How To Ship More Economically in Corrugated Boxes." Hinde & Dauch, Sandusky 47, Ohio

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LETTERS
TO THE EDITORS

One Measure of Readership

We will appreciate tear sheets of the following articles: "The First 2 Minutes Count the Most" and "Lubrication: How Efficient Is Your System?" (Feb. 8); "Cut Labor Turnover Costs" (Feb. 15); "Layoffs: Nobody Likes Them, But—" and "Now You Have To Sell" (Feb. 22).

If your magazine wasn't so darned good, we wouldn't need so many tear sheets.

L. H. Schaut
purchasing agent
Keystone Carbon Co. Inc.
St. Marys, Pa.

• *Sent.—ED.*

What's Gone Before?

Congratulations on the first articles of your 1954 Program for Management series. They have definitely been must reading.

I feel that I have missed something in not having seen the 1953 Program for Management articles. Would it be possible to get tear sheets of them?

Thanks for the interesting and informative reading.

Leland B. Howe
purchasing department
Polaroid Corp.
Cambridge, Mass.

• *Sent.—ED.*

Executives Must Be Molded

I greatly enjoyed your article "Building Better Bosses" (Mar. 22, p. 81), No. 2 in the 1954 Program for Management. This article gives an excellent program to consider in planning executive management development.

Kenneth R. Gromlich
training director
International Textbook Co.
Scranton, Pa.

Speedy Baler at Pontiac

We would like additional information on the scrap baler used at Pontiac Motor Division which was described in your article "Speedy Balers Feature Uniformity" (Mar. 15, p. 109).

I. Tama
Ajax Engineering Corp.
Trenton, N. J.

• *Write to B. E. Brown, assistant plant engineer, Pontiac Motor Division, General Motors Corp., Pontiac, Mich.—ED.*

Guide Proves Lasting Value

Our copy of "Guide for Selecting Tool Steels and Carbides," a special report in your June 16, 1952, issue, has proved of great value to us. We would appreci-

(Please turn to page 12)

NOW— *from Borg-Warner's centrally located Ingersoll Steel Division, at New Castle, Indiana...*

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to your own analysis

If you've been looking for a dependable source for ingots of superior forging quality, it will pay you well to see how Ingersoll can serve you with:

- **Electric furnace carbon steel or alloy grades to your own analysis and specifications.**
- **Ingots in any size and shape from 400 pounds to 23,000 pounds.**
- **Great flexibility in production schedules—set up to fit in with your own forging requirements.**
- **Ample capacity to meet your needs . . . on schedule.**
- **The assurance of uniform high quality from one heat to the next.**

FOR FULL DETAILS—WRITE, WIRE OR PHONE—NOW

ENGINEERING B-W PRODUCTION

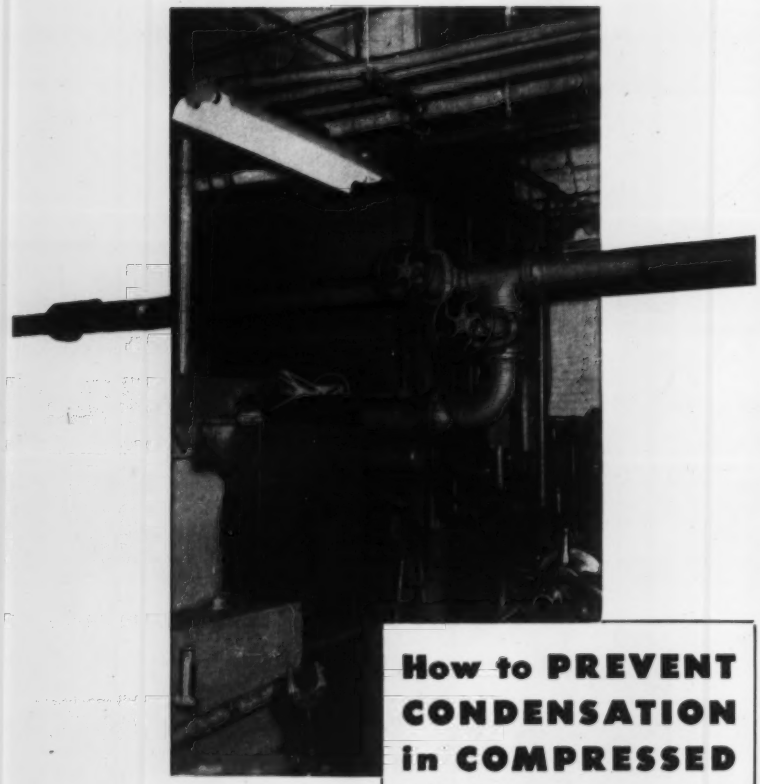
Ingersoll

STEEL DIVISION

Borg-Warner Corporation

New Castle, Indiana

alloy steels • armor plate • carbon electric steel for tank clutch discs • clutch plate steels • heat-resisting steels • IngAclad stainless-clad steel • knife steels saw steels, including high speed hack saw blade steels shovel steels • soft center steel • stainless steels Tem-Cross cross-rolled steel • tillage steels.



How to PREVENT CONDENSATION in COMPRESSED AIR LINES

● Users of pneumatic tools and machinery spend thousands of dollars on repairs and suffer much interruption to production from the condensation of water in their air lines. In compressed gas systems and in processes where compressed air is blown directly on parts and materials in production, there is additional damage.

You can prevent these losses by installing a Niagara Aero After Cooler. It cools the compressed air or gas by evaporative cooling and removes the water before the air enters the receiver. This method brings the air to within a few degrees of the wet bulb temperature, making certain that your compressed air will always be colder than the atmosphere surrounding the lines in your plant, so that no further condensation can take place.

Savings in cooling water pay for the installation. Experience shows that the patented Niagara evaporative cooling method consumes less than 5% of the water required for cooling by conventional means. You save the cost of the water, the cost of pumping it, the cost of disposing of it. These extra savings soon pay for the Niagara Aero After Cooler.

Write for Bulletin No. 98

NIAGARA BLOWER COMPANY

Dept. S , 405 Lexington Ave. New York 17, N. Y.

Niagara District Engineers in Principal Cities of U. S. and Canada

INDUSTRIAL COOLING HEATING • DRYING

NIAGARA

HUMIDIFYING • AIR ENGINEERING EQUIPMENT

LETTERS

(Concluded from page 10)

ate another copy for use in our engineering department.

G. C. Wilhide Jr.
Black & Decker Mfg. Co.
Towson, Md.

• *Sent.—ED.*

Help Wanted Department

One of our good customers has requested that we find a source for them for the following:

"A metering device for the measurement of low-velocity free-air flow such as convective currents around test equipment and air filtration through fabrics."

H. P. Wichelhaus
vice president
Apex Machine Tool Supply Inc.
Charlotte, N. C.

• *Do STEEL's readers know of a source of supply for this type of equipment? —ED.*

Don't Forget Neoprene

We are very much interested in your article "Modern Coatings Add Service Life" (Mar. 15, p. 102). We would like to acquaint you with a particularly important type of industrial protective coating which was not mentioned in this article. That is neoprene in liquid and sheet form and, in particular, Gaco Neoprene, manufactured by our client, Gates Engineering Co., Wilmington, Del.

David A. Horn
Renner Advertisers
Philadelphia

• *Space limitations made it possible to discuss all the various types of protective coatings that are available to industry today. We certainly agree that the new neoprene-type coatings are an important approach to the corrosion problem.—ED.*

Lacing Metal with Metal

In the Apr. 12 issue, there is an article on Metalacing, "Fastening Costs Take a Nose Dive" (p. 100), manufactured by the Crockatt Engineering Co., San Francisco. Will you please send us the full address of that company as we would like full information on this product.

F. P. Tucker
Estey Metal Products Inc.
Red Bank, N. J.

• *It's Crockatt Engineering Co., 1142-3 Phelan Bldg., San Francisco 2.—ED.*

Substitute for Bauxite

Your Mar. 29 issue carries a very interesting Technical Outlook item, "Bauxite Substitute" (p. 101).

In this article it's stated that Fred M. Sievert Associates, Cleveland, are backers of the development. Thus far we have been unable to locate any further address for this company.

G. M. Butler
Carborundum Co.
Niagara Falls, N. Y.

• *It's Fred M. Sievert Associates, 685 Union Commerce Bldg., Cleveland.—ED.*

UNIFORMITY

WEIRTON

cold rolled strip steel

also available in

- HIGH CARBON STRIP
- N-A-X HIGH-TENSILE STRIP
- ELECTROLYTIC ZINC COATED STRIP

For uniform gauge and finish that mean faster production, lower costs and fewer rejects, specify cold-rolled strip steel by Weirton.

Uniformity is a habit at Weirton, where up-to-date plant facilities and careful control from mine to finished product make it easy to attain.

Next time your plans call for cold-rolled strip steel—call Weirton and be sure.

WEIRTON STEEL COMPANY

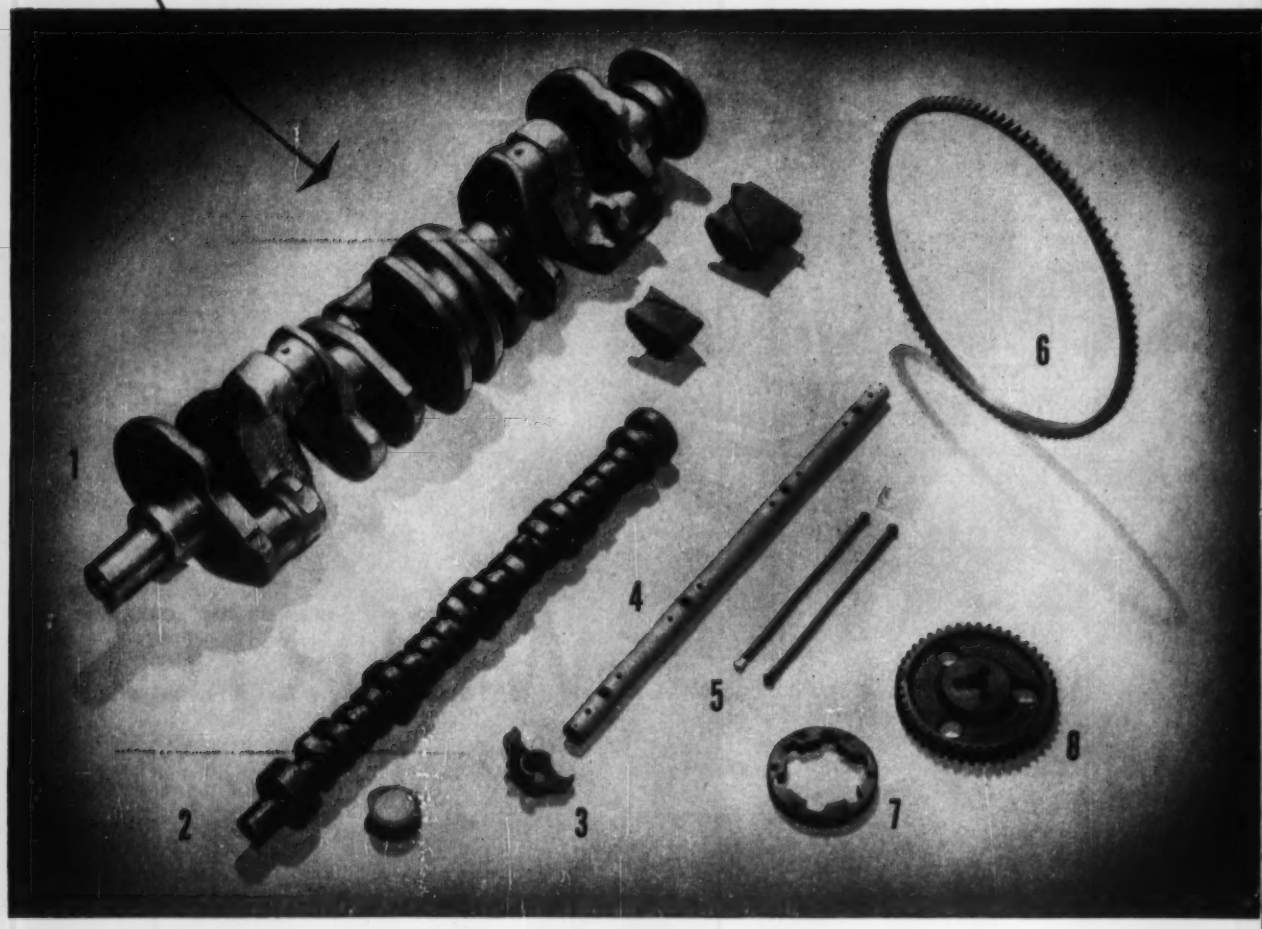
Weirton, West Virginia

NATIONAL STEEL CORPORATION

what we hardened and how we did it

1. Crankshaft
2. Camshaft
3. Rocker arm
4. Rocker arm shaft
5. Push rod
6. Starter ring gear
7. Overriding clutch cam
8. Timing gear

Here's a quick "road show" of Flamatic selective surface hardening applications to automotive parts, demonstrating the wide range of shapes and sizes Flamatic can handle on a high production basis. Operation photos show how flexible tooling makes the basic Flamatic machine extremely productive.



These applications illustrate the three basic Flamatic principles—concentrate heat, control temperature, and confine hardness—which result in exceptional uniformity of results.

While the machines illustrated involve special modifications or tooling for long runs at high production, standard Flamatics permit economical handling of short runs when parts can be handled with relatively simple tooling or work-holding fixtures.

The Cincinnati Flamatic Heat Engineering Laboratory is at your service to analyze your needs, test-run your parts, and make recommendations. Write for Publication No. M-1724.

flamatic

THE CINCINNATI MILLING MACHINE CO.

CINCINNATI

CINCINNATI
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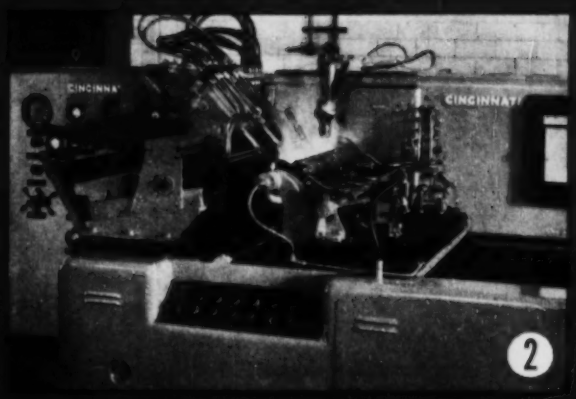
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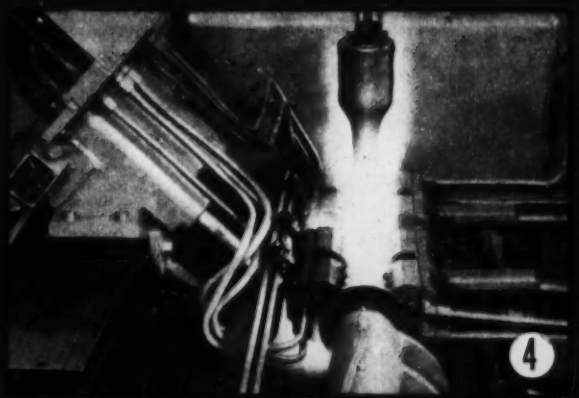
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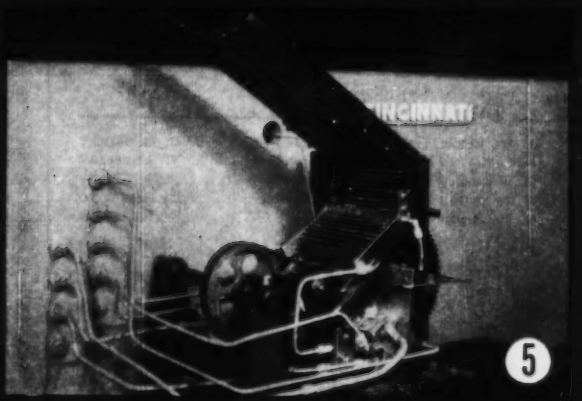
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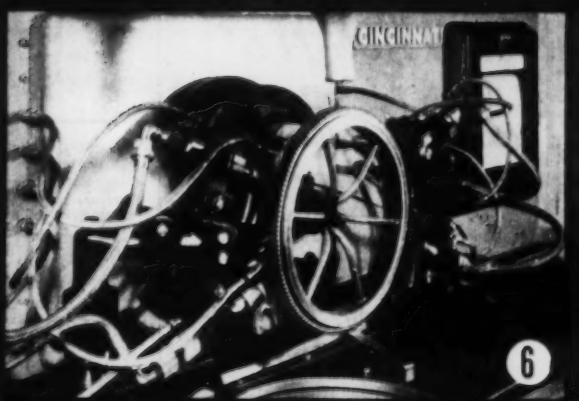
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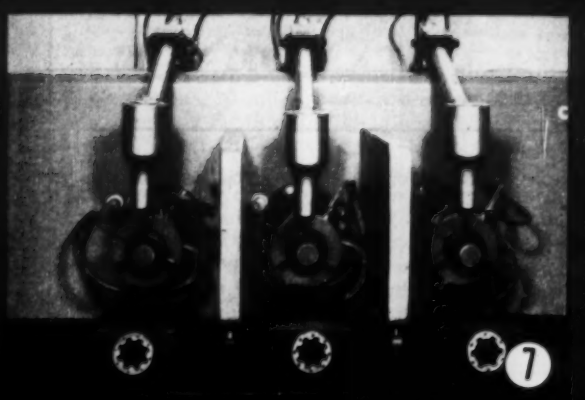
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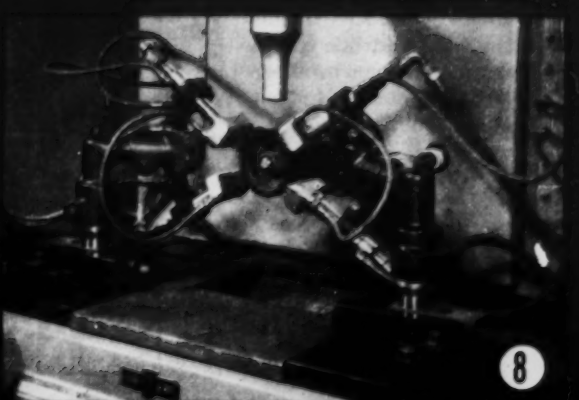
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It's Star "Molyflex"® High Speed! A Clemson exclusive.

You'll find it has all the high-speed cutting qualities of the original Star "Moly"® High Speed Power Blades, *plus* being highly break-resistant. Best of all, no premium cost.

Call your Star distributor today for a trial lot of Star "Molyflex" High Speed Power Blades. Rely on him also for hundreds of the other supplies you need regularly and *quickly* to keep your production going.

Sold Only Through Recognized Distributors.

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Makers of Hand and Power Hack Saw Blades, Frames, Metal and Wood Cutting Band Saw Blades and Clemson Hand and Power Lawn Machines.

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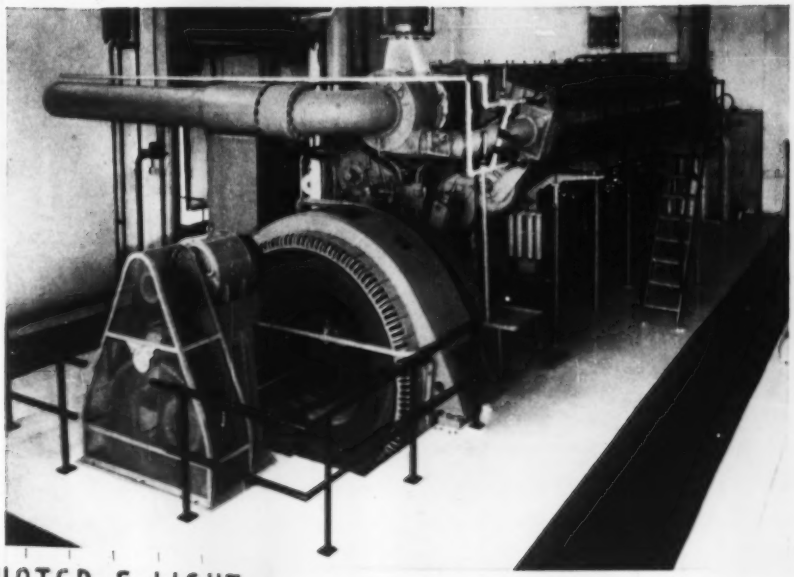


Above Latest addition to the Brady, Texas, plant — a 3,550 hp supercharged Cooper-Bessemer LSV-16 Gas-Diesel installed in August 1952

BRADY'S GREATEST PUBLIC BENEFACTOR

. . . a Cooper-Bessemer-powered municipal plant

TO say that the home-owned water and light plant at Brady, Texas, is a public benefactor is putting it mildly! Since 1942 this plant has advanced to this city of 7,000 more than $600,000 for civic improvements, *plus* service donations exceeding $200,000. It has helped keep taxes very low while defraying the costs of fire fighting equipment, police protection, street lighting, a new "whiteway" system, power for churches and schools at half cost, road improvements, 20 miles of new pavement and various recreation facilities including a swimming pool.

The Brady plant, like so many other efficient municipal plants, is powered with modern Cooper-Bessemer Gas-Diesels, assuring the highest thermal efficiencies known. Brady's latest is a big 3,550 hp supercharged unit installed in August last year. Because of its high efficiency it is kept in virtually 24-hour operation . . . 5205 hours through March 20, producing 7,325,000 kwh. The remainder of Brady's power is supplied by two older tandem-connected Cooper-Bessemers almost as efficient.

To make the most of your power plans for the future, be sure to check on the distinct advantages you stand to gain with modern Cooper-Bessemers.

MOUNT VERNON, OHIO
COOPER-BESSEMER
GROVE CITY, PENNA.

New York Washington, D.C. Bradford, Pa. San Francisco Houston, Dallas, Greggton, Pampa and Odessa, Texas Seattle Shreveport St Louis Los Angeles Chicago Cooper-Bessemer of Canada, Ltd., Halifax, Nova Scotia Tulsa Gloucester, Mass. New Orleans, La.

DIESELS • GAS ENGINES • GAS-DIESELS • ENGINE-DRIVEN AND MOTOR-DRIVEN COMPRESSORS • HIGH PRESSURE LIQUID PUMPS

Orchard Spraying, Berks County, Pennsylvania

Shostal Press Agency Photo

BULLARD

The Invisible Background of Industrial Progress

Modern farming methods, like modern industrial methods, use modern equipment to do the job better and faster. From the ox plow of our forefathers to the tractor with plow attachments, from the scythe to the modern reaper, from the hand hoe to the mechanized cultivator — these are just a few examples of the progress made in the farm equipment field which makes possible greater crops per acre with far less effort and time.

Modern Machine Tools are basic tools in the manufacture of mechanized farm equipment including tractors, sprayers, spreaders, cultivators and reapers — all truly, "The Invisible Background of Industrial Progress."

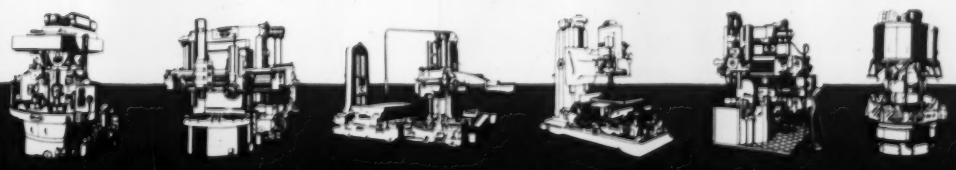
Bullard Horizontal Boring, Milling and Drilling Machine

Available in two sizes, 4" and 5" spindles with optional capacities

Can close machining tolerances be maintained on large, bulky pieces? Of course — if you use a Bullard Horizontal Boring, Milling and Drilling Machine.

Here is a typical application experienced by Combustion Engineering, Inc. of Chattanooga, Tennessee, manufacturers of high-pressure boilers. The total length of the piece to be machined is 11 feet 4-13/32 inches and the job consists of boring fifteen 4-inch holes in a row and then milling the ends. This was accomplished in four operations per hole, holding each hole within a tolerance of +.001"–.000. Total machining time — eight hours per piece.

If you are looking for a versatile, rugged, horizontal boring, milling and drilling machine with "built-in" accuracy and efficiency, investigate Bullard. Your Bullard Representative will explain its many features or, write to The Bullard Company, Bridgeport 2, Connecticut — phone 6-2511.



BULLARD

Easier wire pulling

WHY YOUNGSTOWN BUCKEYE CONDUIT IS BETTER

Youngstown is the one manufacturer who makes rigid steel conduit from ore to finished product. This enables Youngstown to control the complete manufacturing process—your insurance that each length of "Buckeye" is made of top-grade steel.

Youngstown

QUALITY · YOUNGSTOWN · SERVICE

●Smooth bends reduce wire pulling time, especially where workers are cramped for room. Buckeye always bends easily and smoothly. Interior surfaces are mirror-smooth, never chip or break under bending or shock. That's why so many contractors specify Youngstown rigid steel conduit.

THE YOUNGSTOWN SHEET AND TUBE COMPANY Manufacturers of Carbon, Alloy and Yoloy Steel

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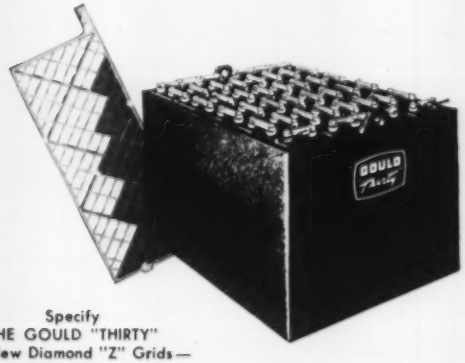
TIRELESS ACTION

THANKS TO BATTERY POWER!

Tireless action—that's what your industrial trucks have got to have to keep up with today's materials handling needs. That's what you get when they're powered with new Gould "Thirty" Batteries with Diamond "Z" Grids. Extra reserve, extra performance, extra stamina are built into these batteries to keep your trucks in action all day long. There's no power like battery power—no battery power like *Gould* power.



Specify
THE GOULD "THIRTY"
with New Diamond "Z" Grids—
America's Finest
Industrial Truck Battery

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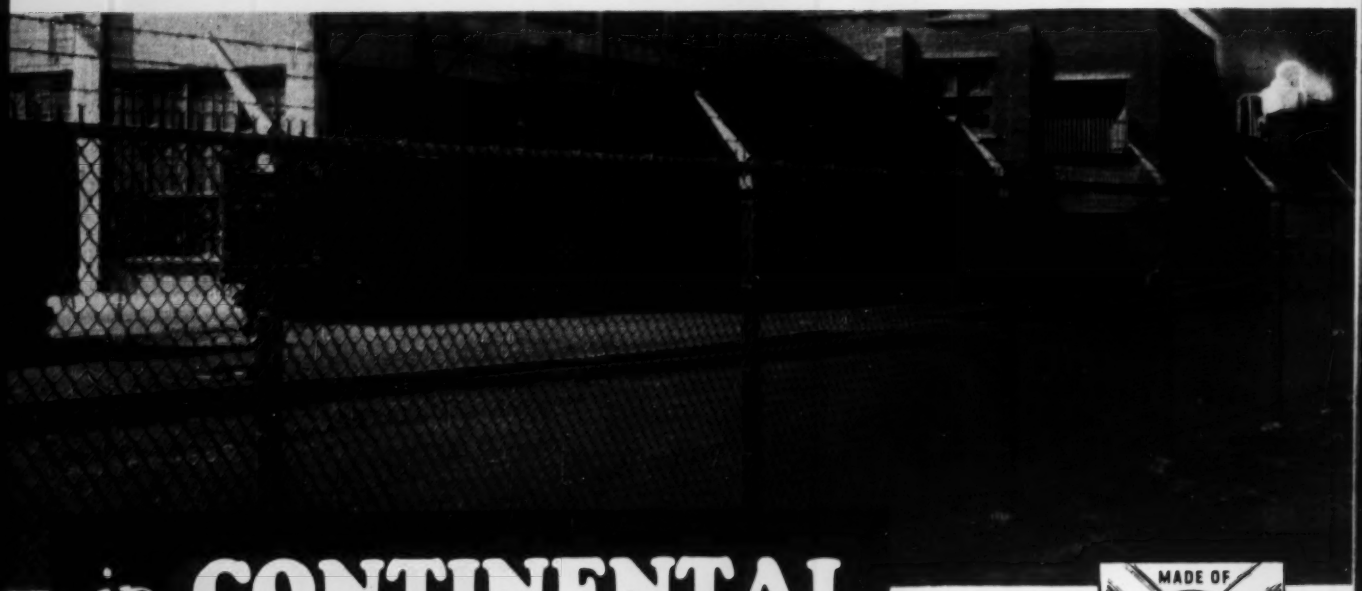
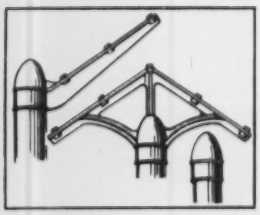
Features that Build **Permanence..**

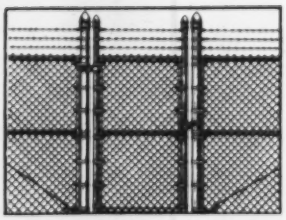


in CONTINENTAL Fence Protection



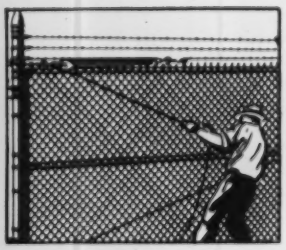
HEAVIER POST, CAPS—FITTINGS

Heavy malleable iron, bullet shaped post caps provide a moisture-proof seal. Combination malleable iron and 12 gauge pressed steel self-locking barb arms are heaviest, strongest obtainable.



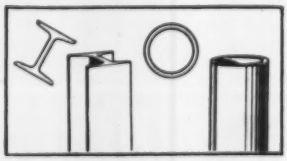
EASIER OPERATING WELDED GATES

All gates are equipped with positive-locking devices suitable for padlocking. They are stronger, neat appearing with improved pivot-type hinges. Counter-balanced gate-keepers automatically hold gates open. Securely braced slide, swing and and cantilever gates available.



ENGINEERED AND ERECTED FOR LONGER LIFE

Continental Fence Engineers help plan and lay out your installation. Line posts are securely set in solid concrete. Tough brace bands, rods and trusses hold Continental Fence in perfect alignment for extra years of worry-free property protection.



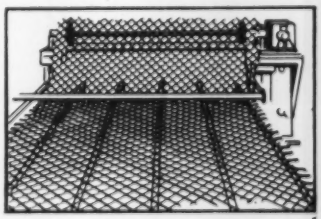
H-SECTION LINE POSTS 15% HEAVIER

H-Section line posts of special analysis copper steel provide more resistance to bending at right angles to fence line, where most damage occurs. Extra heavy tubular corner posts furnish maximum resistance in every direction.

MADE OF KONIK® STEEL

CONTINENTAL KONIK STEEL

Only Continental Fence is made of Konik steel containing copper, nickel and chromium for higher tensile strength and greater rust resistance. Insist on Continental Chain Link Fence. Konik steel is one of the longer-life extras only Continental can offer you.



GALVANIZED AFTER WEAVING

Full gauge, high tensile strength Continental Fence wire is woven into exact mesh, then completely immersed in a temperature controlled bath of molten zinc . . for a longer, more rust resistant armor coat. Fabric withstands temperature changes . . retains tension and perfect alignment.

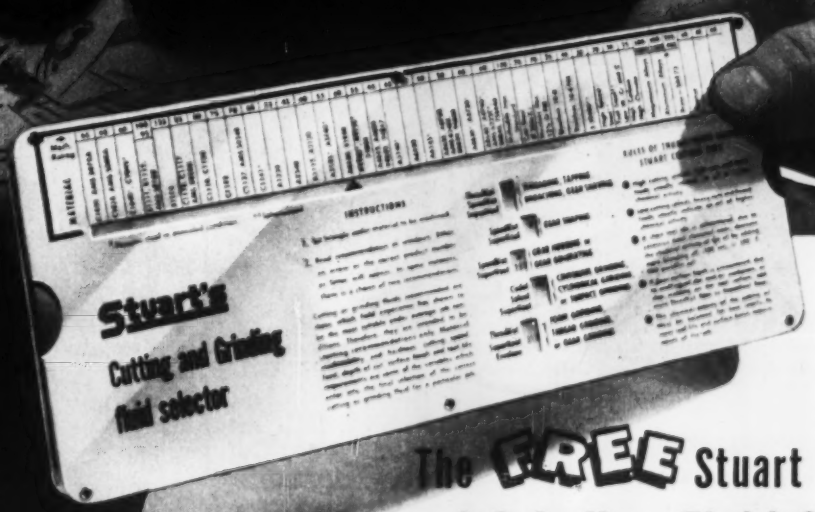
CONTINENTAL STEEL

CONTINENTAL

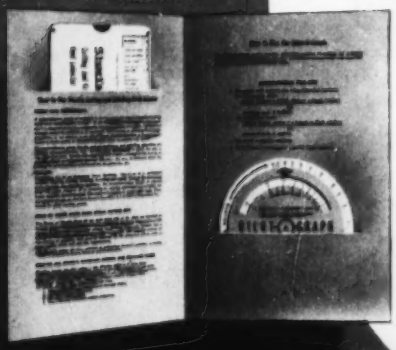
STEEL CORPORATION · KOKOMO, INDIANA

Producers of Manufacturers Wire in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Lacquer Finished, Bright, and Special Wire. Also, Coated and uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

What Cutting Fluid to Use?



The FREE Stuart Cutting and Grinding Fluid Selector has the answer



There is a right cutting fluid for every cutting and grinding job . . . and sometimes it's hard to know where to start in selecting one. For that reason Stuart has developed this FREE Cutting and Grinding Fluid Selector. It's a ready reference that recommends cutting and grinding fluids that field experience has shown to be most suitable under average job conditions. In your hand it's a quick guide to starting recommendations for any job.

Send for your Stuart Cutting and Grinding Selector today. Remember, more than a "coolant" is needed . . . let the Stuart Selector help you get the right cutting fluid to give you the best results.

Stuart's Cutting and Grinding Fluid Selector and Dilut-O-Graph Folder

This handy folder contains a Stuart Cutting and Grinding Fluid Selector and a Dilut-O-Graph . . . a circular slide rule that makes the diluting of cutting fluids quick and easy. They are double-barreled assurance of having the right cutting fluid on all jobs.

send today

CLIP TO YOUR COMPANY LETTERHEAD AND MAIL

D. A. STUART Oil Co. Ltd.
2735-37 S. Troy St.
Chicago 23, Ill.

Please send the Stuart Cutting and Grinding Fluid Selector and Dilut-O-Graph Folder.

Name_____

Title_____

☐ Have Stuart Representative Call

More Than a "Coolant" is Needed

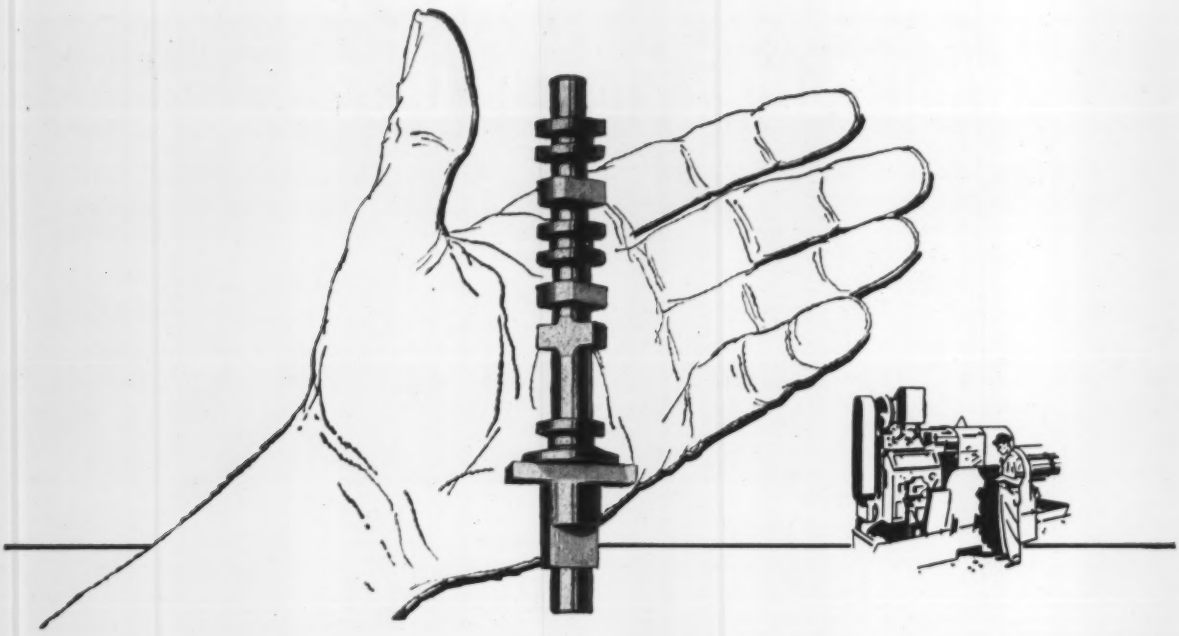
D. A. Stuart Oil Co.

EST. 1865

TIME-TESTED CUTTING FLUIDS AND LUBRICANTS

2727 S. Troy St., Chicago 23, Ill.

In Canada: Canadian D. A. Stuart Oil Co., Ltd
3575 Danforth Ave., Toronto



MACHINABILITY CAN HELP YOU GET THE MOST OUT OF YOUR AUTOMATICS

● Are you getting the speeds and feeds you really could out of your automatics? Are you sure you couldn't produce more parts at lower unit cost?

The answer may be in the machinability of the steel you use. And that's why we at Union Drawn are so fussy about our steels.

Just to make sure that you get the most out of the Union Drawn Steels you buy from us, one of our metallurgists or machining engineers will be glad to work with your set-up man. They can swap hints on tool angles, heavier speeds and feeds, and the best ways to run Union Drawn Steels in *your plant* on *your machines.*

The result? More parts in the pan, fewer in the reject box. Production is maintained or increased. So are profits.

Remember: the most important factor that influences unit parts costs is the *machinability* of the steel you use. And at Union Drawn, *machinability* is our prime concern. When may we tell you about it?

REPUBLIC STEEL CORPORATION
Union Drawn Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

Free-Machining Bessemer
Alloy and Enduro Stainless Steels

Union Cold Drawn Special Sections

Union Cold Drawn and Ground Rounds; Turned and Polished Rounds; and Turned, Ground and Polished Rounds (Union Precision Shafting)

REPUBLIC *Union*
COLD DRAWN STEELS

REPUBLIC STEEL

Profitable versatility for jobbing work!

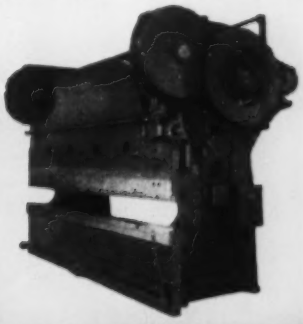
Dished heads, a common problem in the tank field are being formed in a range of sizes with a simple low cost die and without change in set-up.

Cincinnati Press Brakes are profitable for bending, punching, press work and a great variety of jobbing applications.

Cincinnati Press Brakes, with low-cost tooling, simplify difficult sheet metal and plate jobs and are versatile, profitable and busy tools in any fabricating shop.

Write for Press Brake Catalog B-4.

Photos courtesy Bishopric Products Co.

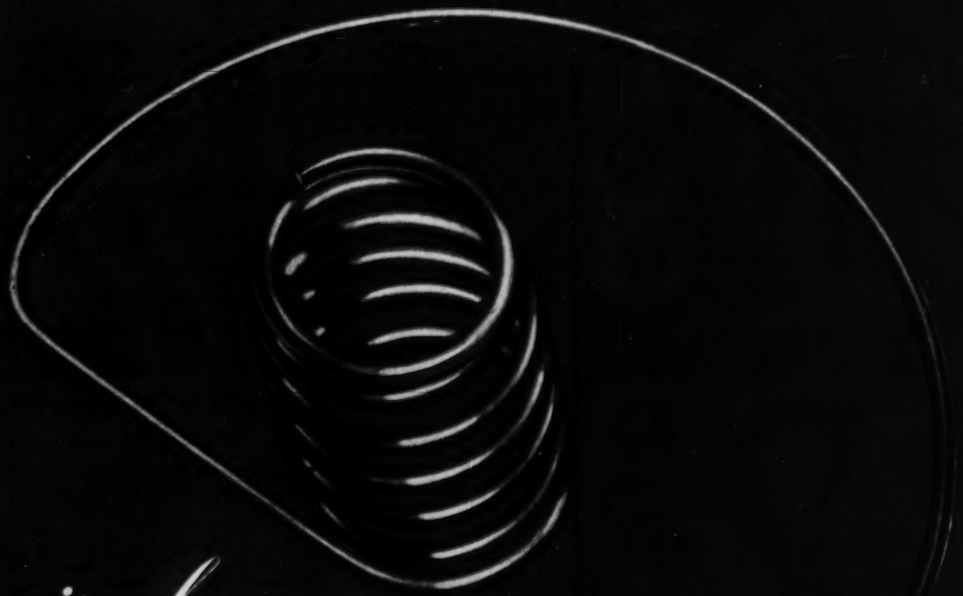


CINCINNATI

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

a SPRING



is always

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BRISTOL, CONNECTICUT

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B·G·R COOK PLANT
ANN ARBOR MICHIGAN

10 PROVEN SOURCES COAST TO COAST

F. N. MANROSS AND SONS CO.
BRISTOL CONNECTICUT

OHIO DIVISION
1825 EAST FIRST ST. DAYTON, OHIO

DUNBAR BROTHERS COMPANY
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SEABOARD Coil Spring Div.
15001 S. BROADWAY GARDENA, CALIF.

CALENDAR
OF MEETINGS

May 2-4, American Steel Warehouse Association: Annual meeting, Hotel Drake, Chicago. Association address: 442 Terminal Tower, Cleveland 13. President: Walter S. Doxsey.

May 3, Wire Reinforcement Institute Inc.: Annual spring meeting, Boca Raton hotel and club, Boca Raton, Fla. Institute address: National Press Bldg., Washington 4. Managing director: Frank B. Brown.

May 3-4, American Management Association: Special conference on capital equipment replacement, Hotel Commodore, New York. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

May 3-5, American Mining Congress: Coal convention, Hotel Netherland Plaza, Cincinnati. Congress address: 1102 Ring Bldg., Washington 6. Executive vice president: Julian D. Conover.

May 3-5, Association of Iron & Steel Engineers: Spring meeting, Bellevue-Stratford hotel, Philadelphia. Association address: 1010 Empire Bldg., Pittsburgh 22. Managing director: T. J. Ess.

May 3-6, Air Pollution Control Association: Annual meeting, Patten hotel, Chattanooga, Tenn. Association address: 4400 Fifth Ave., Pittsburgh 31. Executive secretary: Harry C. Ballman.

May 3-8, Concrete Reinforcing Steel Institute: Annual meeting, Boca Raton hotel and club, Boca Raton, Fla. Institute address: 38 S. Dearborn St., Chicago 3. Managing director: H. C. Delzell.

May 4, Steel Joist Institute: Annual meeting for members, Boca Raton hotel and club, Boca Raton, Fla. Institute address: Dupont Circle Bldg., Washington 6. Managing director: C. H. Luedeman.

May 4-6, Electronic Components Symposium: Auditorium, U. S. Department of Interior, Washington. Information: Radio-Electronics-Television Manufacturers Association, 777 14th St. NW, Washington 5.

May 4-7, American Welding Society: National spring technical meeting and exposition, Hotel Statler and Memorial Auditorium, Buffalo. Society address: 33 W. 39th St., New York 18. Secretary: J. G. Magrath.

May 7, Investment Casting Institute: General meeting, Hotel Carter, Cleveland. Institute address: 27 E. Monroe St., Chicago 3. Executive secretary: Harry P. Dolan.

May 8-14, American Foundrymen's Society: Annual convention and biennial exposition, Public Auditorium, Cleveland. Society address: 616 S. Michigan Ave., Chicago 5. Secretary-treasurer: W. W. Maloney.

May 9-12, Liquefied Petroleum Gas Association Inc.: Annual meeting and exhibit, Hotel Conrad Hilton, Chicago. Association address: 11 S. LaSalle St., Chicago 3. Secretary: Arthur C. Kreutzer.

May 10-11, American Management Association: Special marketing conference, Hotel Commodore, New York. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

May 10-12, Purdue Industrial Waste Conference: Purdue University, sponsor. Purdue Memorial Union, Lafayette, Ind. Information: Don E. Bloodgood, chairman, C. E. Bldg., Purdue University, Lafayette, Ind.

May 12-14, Porcelain Enamel Institute Inc.: Midyear divisional conference, Edgewater Beach hotel, Chicago. Institute address: 1346 Connecticut Ave. NW, Washington 6. Secretary: John C. Oliver.

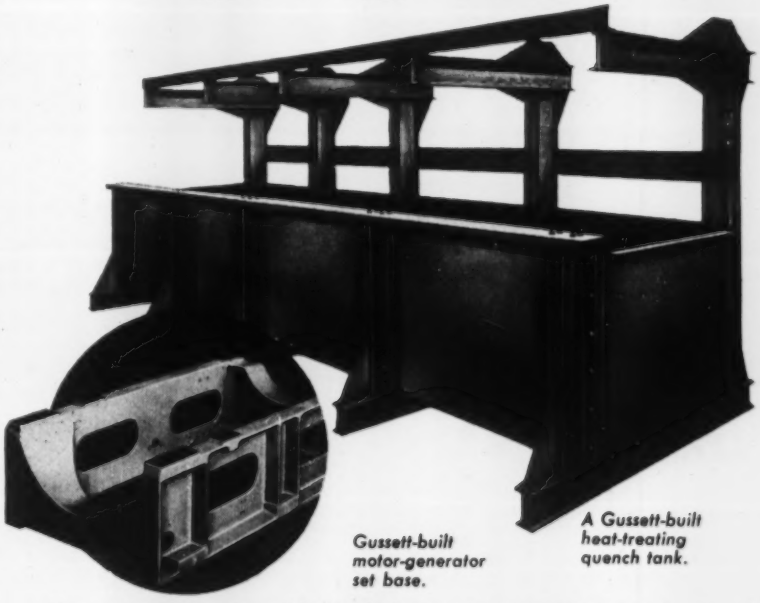
May 16-19, American Institute of Chemical Engineers: Meeting, Hotel Kimball, Springfield, Mass. Institute address: 12 E. 41st St., New York 17. Secretary: Stephen L. Tyler.

May 16-19, Industrial Furnace Manufacturers Association Inc.: Spring meeting, The Homestead, Hot Springs, Va. Association address: 412 Fifth St. NW, Washington. Secretary: T. F. Sheckels.

May 17-19, National Industrial Distributors Association: Annual meeting, Hotel Waldorf-Astoria, New York. Association address: 1900 Arch St., Philadelphia 3. Secretary: H. R. Rinehart.

GUSSETT

TAKES THE HEADACHES OUT OF BUYING WELDMENTS



Gussett-built motor-generator set base.

A Gussett-built heat-treating quench tank.

You save time and trouble (and, frequently, more than a little of the cost) when you have Gussett make your weldments.

Gussett engineers are able to prepare working drawings for most efficient fabrication from your design prints, descriptions or service requirement data, relieving you of this responsibility and insuring economical production and good delivery schedules.

Gussett's complete, modern plant has every facility for handling the work efficiently and speedily . . . whether a single piece or many duplicate units . . . yet it is small enough to permit every job to be accorded the personal interest vital to successful custom fabrication.

. . . And Gussett brings to bear on every job the experience and "know-how" of 40 years of pioneering in steel and alloy plate fabrication.

Include Gussett in your next "Request for Quotation" mailing. If it requires personal contact, a wire or phone call (Canton 7-3413) will bring a representative qualified to give every possible assistance.

THIS FILE BULLETIN WILL HELP YOU to plan your fabricating jobs. It contains a complete listing of Gussett facilities and capabilities. Write for a copy.

GUSSETT

BOILER & WELDING, INC.

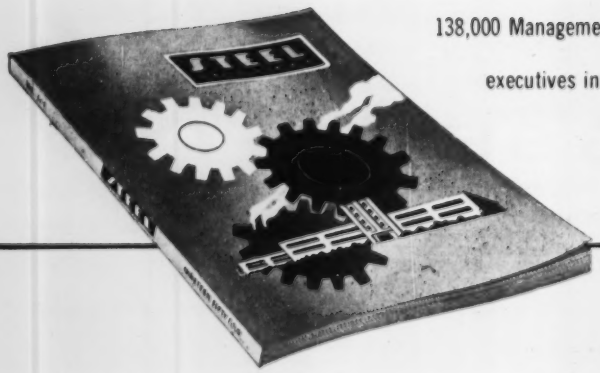
CANTON 10, OHIO

PLAIN OR LINED TANKS • PRESSURE VESSELS • HOPPERS • VULCANIZERS
GENERAL STEEL AND ALLOY PLATE FABRICATION • BINS • STACKS
LARGE DIAMETER PIPE • WELDMENTS • MACHINE BASES AND FRAMES

If you have a product that needs a push

Put the strength of STEEL

into your advertising program



138,000 Management, Production, Engineering and Purchasing executives in metalworking read it . . . use it . . . depend upon it!

B MX-STEEL C.H. OR BESS.

54% Production Increase plus Greater Efficiency

33.5% Production Increase and 167% longer Tool Life

20% Production Increase with Superior Finish

Performance like this

CUTS YOUR FABRICATING COSTS

These typical operating results show how production men are taking advantage of the *PLUS* machinability of B&L "MX" Cold Finished Screw Stock.

This modern high-sulphur type of Special Free-Machining Steel is made by either the Open Hearth or Bessemer practice —each with practically identical chemical analysis.

B&L "MX" Cold Finished Bars were developed with TOP MACHINABILITY uppermost in mind. They will give you 20% to 50% more net production through higher spindle speeds, heavier feeds, prolonged tool life, reduced rejections, improved machine-cut finish and closer tolerances, all of which clearly spells lower unit part costs.

Specify this type instead of standard B-1113 or C-1213 grades.

Our search for FREER MACHINING STEELS GOES ON AND ON.

Write for further details of B&L MX Cold Finished Bar Steel—Its excellent machining qualities may be the answer to your production problem.

BLISS & LAUGHLIN, INC.

GENERAL OFFICES: HARVEY, ILLINOIS

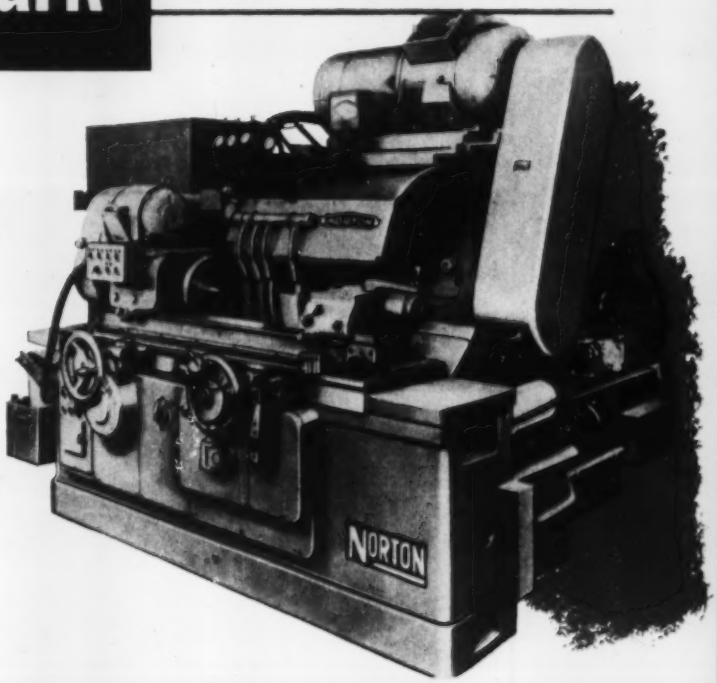
SALES OFFICES IN ALL PRINCIPAL CITIES

FOUR PLANTS: HARVEY, ILL. • DETROIT, MICH. • BUFFALO, N. Y. • MANSFIELD, MASS.

BL SINCE 1891

Another first

...For Delpark Filtration



NORTON'S GRINDER Features *Built-in* Delpark Filtration

Recognition by Norton engineers of DELPARK as the finest in coolant filtration is acknowledged by the incorporating of DELPARK Filtration *into* the design of a new grinding machine introduced by Norton.

This machine is the Norton Type CM-1 Heavy Duty Semiautomatic Multi-Wheel Grinder. This unit utilizes several grinding wheels mounted between bearings for simultaneously grinding different diameters on the work piece in a single plunge-grind operation. Heavy sludge loads produced are immediately removed eliminating time loss necessary to clean reservoirs. Coolant supply is constantly kept clean and free of particles which would spoil the finish of ground work.

Thank you Norton, for your recognition of DELPARK Filtration as the finest.

Write for the Delpark brochure on Norton's new type grinder

Norton Type CM-1 Heavy Duty Semiautomatic Multi-Wheel Grinder with built-in Delpark Filtration

Delpark INDUSTRIAL FILTRATION

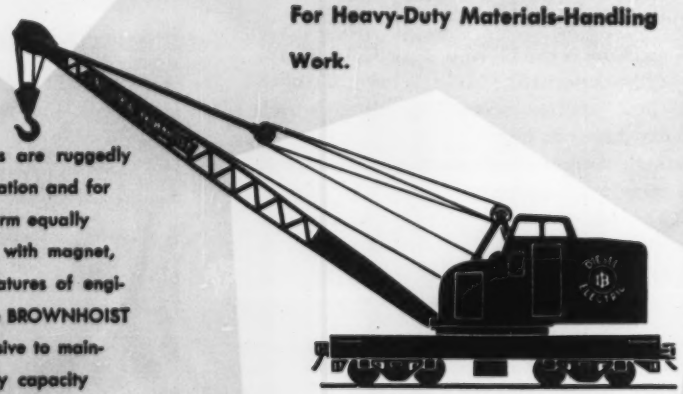
BACKED BY MORE THAN 30 YEARS EXPERIENCE IN INDUSTRIAL FILTRATION

INDUSTRIAL FILTRATION CORPORATION, 50 INDUSTRIAL AVENUE, LEBANON, INDIANA

INDUSTRIAL BROWNHOIST 250 TON

THE WORLD'S LARGEST DIESEL POWERED RAILROAD CRANE

Designed primarily for Railroad Emergency Service, this 250-Ton Crane is the biggest member of the BROWNHOIST Family of Powerful Locomotive Cranes For Heavy-Duty Materials-Handling Work.



Brownhoist Diesel Locomotive Cranes are ruggedly built for continuous, heavy-duty operation and for long, dependable service. They perform equally well as switch engine or crane and with magnet, hook or bucket. Many advanced features of engineering design and construction make BROWNHOIST Cranes easy to operate and inexpensive to maintain. Standard models to meet every capacity requirement. Write for complete information.

BROWNHOIST builds better cranes

LAMSHELL BUCKET

COAL-ORE BRIDGE

CAR DUMPER

INDUSTRIAL BROWNHOIST CORPORATION, BAY CITY, MICHIGAN • DISTRICT OFFICES: New York City, Philadelphia, Cleveland, San Francisco, Chicago; Canadian Brownhoist Ltd., Montreal, Quebec • AGENCIES: Detroit, Birmingham, Houston, Los Angeles.

159

You never "Get Stuck" with Pins Like These!

In the finest costume jewelry . . . pins, brooches, clips, buckles and links . . . you will find the base of much of it to be good *solid* Bristol Brass.

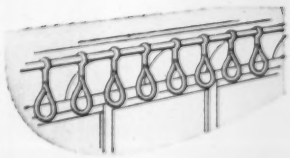
For manufacturers of these high-style lines know that they can always depend on rich low Brass from the Bristol mills for clean surface, always free from pits, and for color that is always uniform. They know that Bristol Brass gets to their plants right on time and ready for processing.

And *you* . . . no matter what type of Brass strip, coil, rod, or wire you need for any type of product . . . will likewise find that Bristol supplies it right on schedule, and right according to specifications, shipment after shipment. "*Large statement?*" Test it for yourself. Write, wire, or phone Bristol 9246.

THE BRISTOL BRASS CORPORATION

has been making Brass strip, rod and wire here in Bristol, Connecticut since 1850, and has offices and warehouses in Boston, Chicago, Cleveland, Detroit, Milwaukee, New York, Philadelphia, Providence, Rochester. The Bristol Brass Corporation of California, 1217 East 6th St., Los Angeles 21. The Bristol Brass Corp. of Ohio, 1607 Broadway, Dayton.

"Bristol-Fashion" means **Brass at its Best**



For HIGH Strength . . .
LEAST Weight . . .
LOW Cost . . .

A tube ——— every time!

As simple as two plus two. When you want the *most* strength with the *least* weight—use a tube. In proportion to size and weight, it's the strongest structural form you can buy.

Think about some of the applications of NATIONAL Electric Welded Mechanical Steel Tubing; applications where sturdiness with lightness is mandatory—playground equipment, metal furniture, seat frames, fence posts, guard rails, lighting fixtures, and hundreds of mechanical applications like automobile tail pipes, shot hole casing, and flue tubes for water heaters. And junior's bicycle. How could he possibly manage it if it were built of *solid steel?* And motorcycles? And baby carriages?

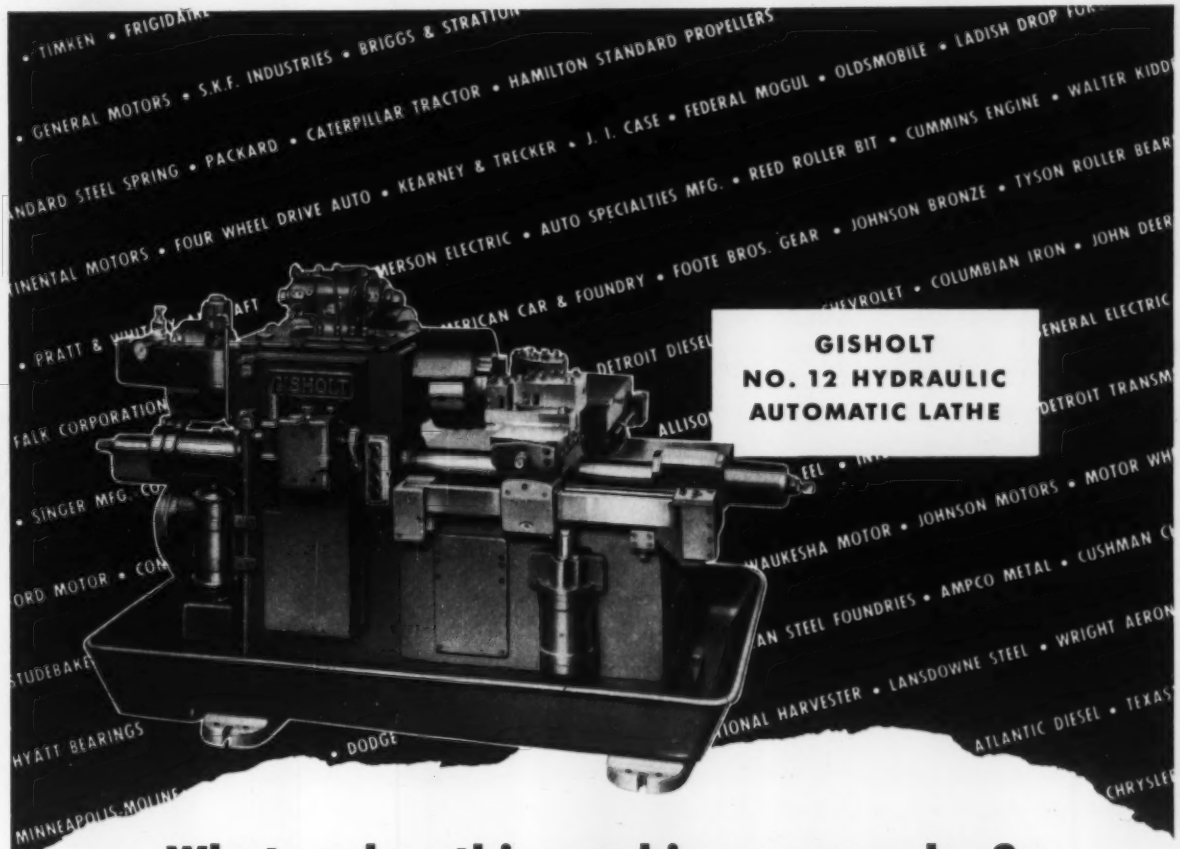
Steel tubing is rigid. It has high resistance to torsional and bending stresses. It's easy to transport, easy to fabricate. The smooth surface requires a minimum of paint or other decorative finish.

For good commercial quality mechanical steel tubing at low cost, specify—or rather, insist on—NATIONAL. It is available in sizes up to and including 4" OD. Easy to bend, easy to form, it is made by the world's largest manufacturer of steel tubular products.

Our engineers will gladly share with you their experience in the applications of NATIONAL Electric Welded Mechanical Steel Tubing. Write to National Tube Division, United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

NATIONAL TUBE DIVISION
UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.
(Tubing Specialties)
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS **NATIONAL** Electric Welded **MECHANICAL**
STEEL TUBING
UNITED STATES STEEL



What makes this machine so popular?

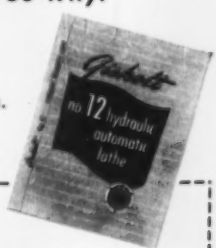
It's the simple basic application of hydraulic principles—perfected through the years. It's a single spindle machine that handles all classes of work—holding with a chuck or an arbor, with fixtures, or with a work driver for between centers. Front carriage alone will perform 14 different cycles. Independent rear slide can be positioned at any angle to the work. Feeds are infinitely adjustable...not limited by cams. Here's the versatility, the speed, the automatic cycle, and the easy change-over that mean big savings for scores of users. Why not for you?

If you have parts up to 12″ to produce at lower cost, look at the Gisholt No. 12 Hydraulic Automatic Lathe. Call your Gisholt representative. Or write us.

THE GISHOLT ROUND TABLE
represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

This new catalog will show you why.

All operating features are clearly described, fully illustrated. Here, too, are 28 different jobs to show many classes of work and tooling possibilities. Write for your copy.



Gisholt Machine Company
Madison 10, Wisconsin

Please send my copy of the catalog describing the Gisholt No. 12 Hydraulic Automatic Lathe.

Name.....*Title*.....

Company.....

Address.....

City.....*State*.....

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES
SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

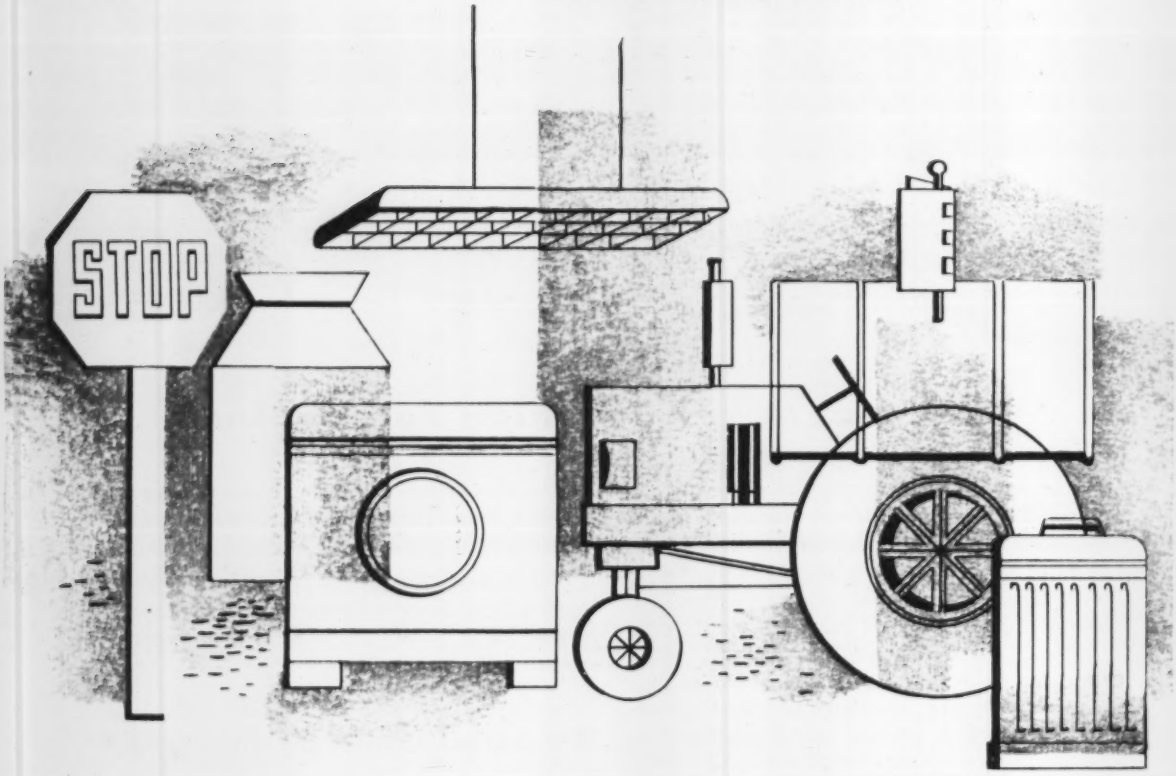
these industries:

Farm Implement and Machinery... Container... Lighting Fixture . . . Home Laundry Equipment . . . Advertising and Highway Sign . . . Hardware

use GRANITE CITY STEEL

to make these products

(and many more)



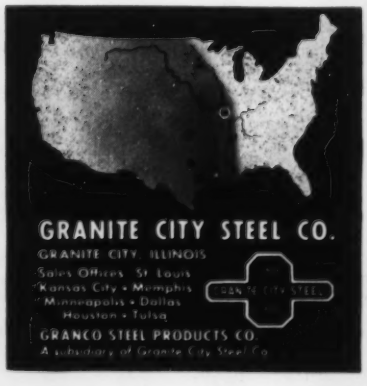
Can Granite City help solve your steel problems?

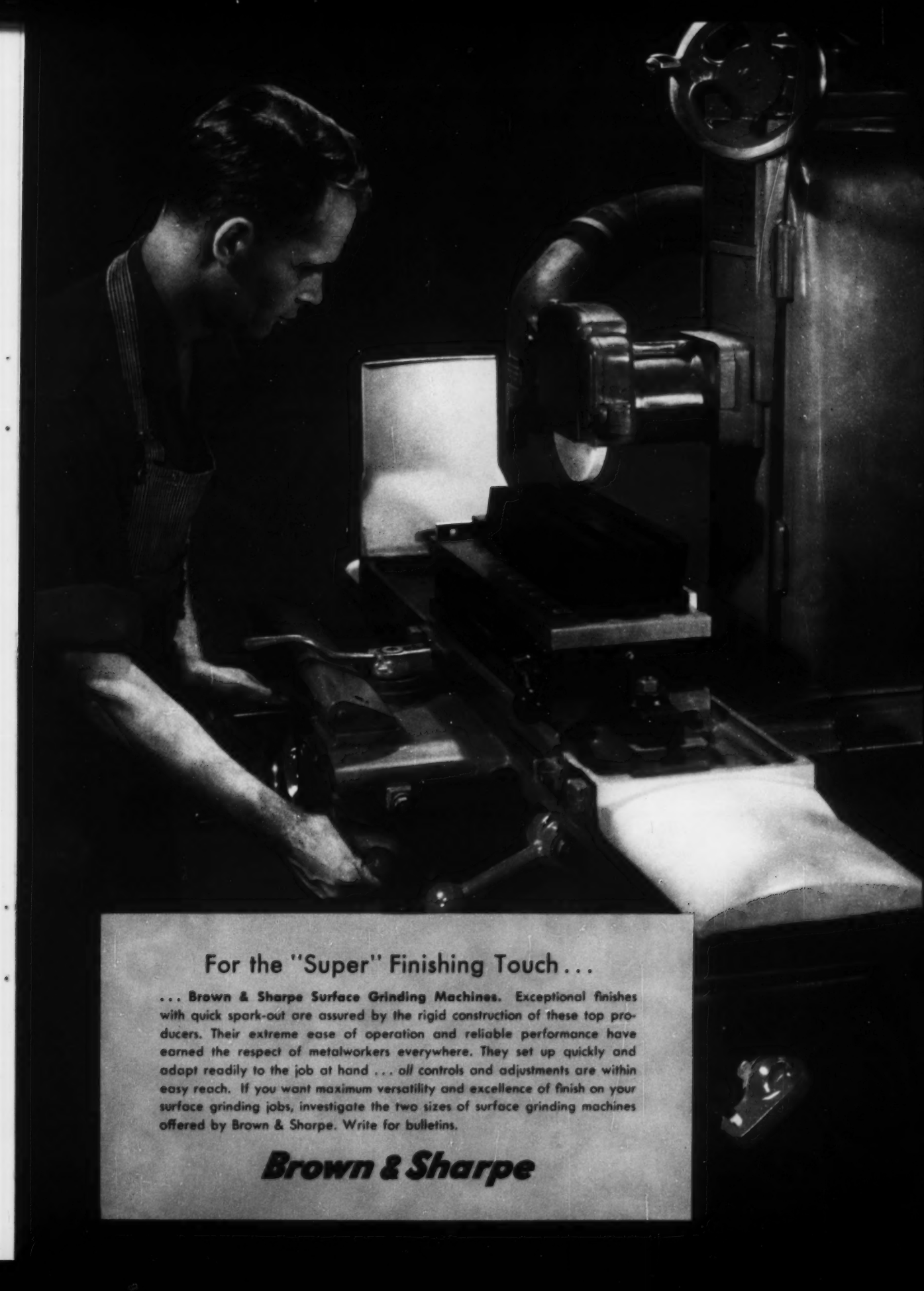
Through our fully integrated mill, close by St. Louis, now flows a greatly increased tonnage and variety of top-quality flat-rolled steel products.

This is steel made for *our customers'* orders to solve *our customers'* problems. This is steel backed by 76 years of experience, its quality guaranteed by the world's most modern equipment and the skill of 4800 loyal and able Granite City Steelmakers.

By its long-standing reputation for quality steel, by its infinite attention to customer satisfaction, by the natural shipping advantages of Granite City Steel's location—this is the leading steel source for Middle America. We invite *your* inquiry about the steel problem in your business. We *know* we can help you.

PLATES • HOT ROLLED SHEETS • COLD ROLLED SHEETS • ELECTRICAL SHEETS • PORCELAIN ENAMELING SHEETS • GALVANIZED STEEL ROOFING AND SIDING • TIN MILL PRODUCTS





For the "Super" Finishing Touch . . .

. . . **Brown & Sharpe Surface Grinding Machines.** Exceptional finishes with quick spark-out are assured by the rigid construction of these top producers. Their extreme ease of operation and reliable performance have earned the respect of metalworkers everywhere. They set up quickly and adapt readily to the job at hand . . . *all* controls and adjustments are within easy reach. If you want maximum versatility and excellence of finish on your surface grinding jobs, investigate the two sizes of surface grinding machines offered by Brown & Sharpe. Write for bulletins.

Brown & Sharpe

"Mike" Your I.D.'s... No Masters Needed

The New Intrimik Internal Tri-Point Micrometer reduces measurement of bores and holes to a simple "miking" operation . . . saves you the cost of expensive plugs and setting rings. Made in 20 sizes, these handy micrometers measure bores from 0.275" to 8.000" . . . give readings directly in increments of 0.0001", 0.0002", or 0.0005" depending on size. Provide positive accuracy possible only through three-point bearing design. Write for complete illustrated Bulletin describing the new Intrimik.

BUY THROUGH YOUR LOCAL DISTRIBUTOR

Brown & Sharpe

BROWN & SHARPE MFG. CO. PROVIDENCE 1, R.I., U.S.A.

Milling Machines • Grinding Machines • Screw Machines
Cutters • Machine Tool Accessories • Machinists' Tools
Electronic Measuring Equipment • Johansson Gage Blocks
Permanent Magnet Chucks • Pumps

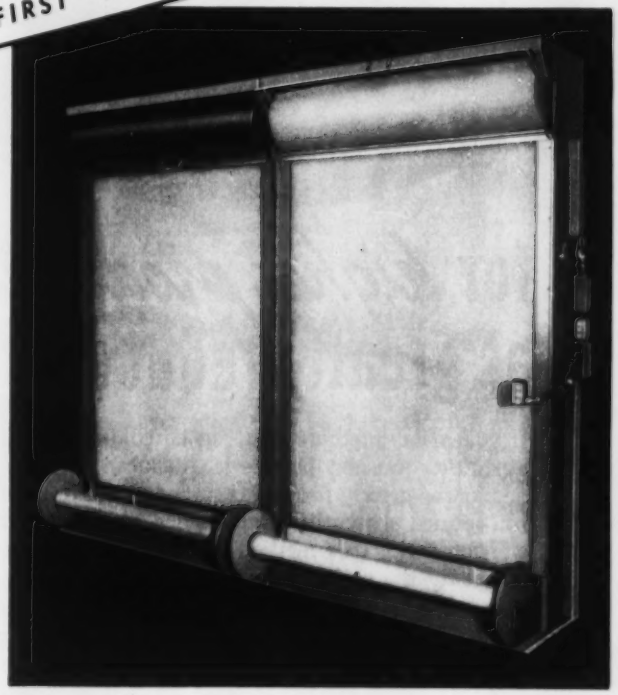
Printed in U.S.A.

INTRODUCING THE *NEW*

Roll-O-MATIC

ANOTHER AIR FILTER "FIRST" FROM AAF

A "Dry" Type Viscous Air Filter That Maintains Its Efficiency Automatically Up To One Year With One Roll of Low-Cost AMER-glas Media



A ROLL-O-MATIC filter of two 5'0" wide by 8'0" high sections—capacity 26,700 cfm.

So automatic you don't even push a button! That's the new ROLL-O-MATIC—a high efficiency air filter that maintains its established operating resistance for months on end without an hour lost or a dollar spent for maintenance.

The ROLL-O-MATIC is a viscous filter with "dry" type characteristics—combines the efficiency and simplified maintenance of a dry filter with the high dust holding capacity and velocity characteristics of a viscous unit. The filtering media is a 2" thick AMER-*glas* mat made up of continuous glass fibres sprayed with non-flammable Viscosine fluid-jell.

The AMER-*glas* media, in roll form, is mounted at top of the ROLL-O-MATIC and moves as continuous curtain down the face of the filter and re-rolled on motor-driven spool at the bottom. A pressure differential switch regulates the movement of the filter curtain so that media usage is in direct proportion to the dust content of the air. Field tests indicate that, under normal operating conditions, a single roll of AMER-*glas* should last *one year* per 10,000 cfm of capacity. But regardless of amount of media used, the cost will be less than that of throw-away filters.

Other ROLL-O-MATIC advantages are (1) lighter weight, (2) low-cost installation and (3) elimination of all drain and water connections. For complete design and engineering data, call your local AAF representative or write direct for Bulletin No. 248.

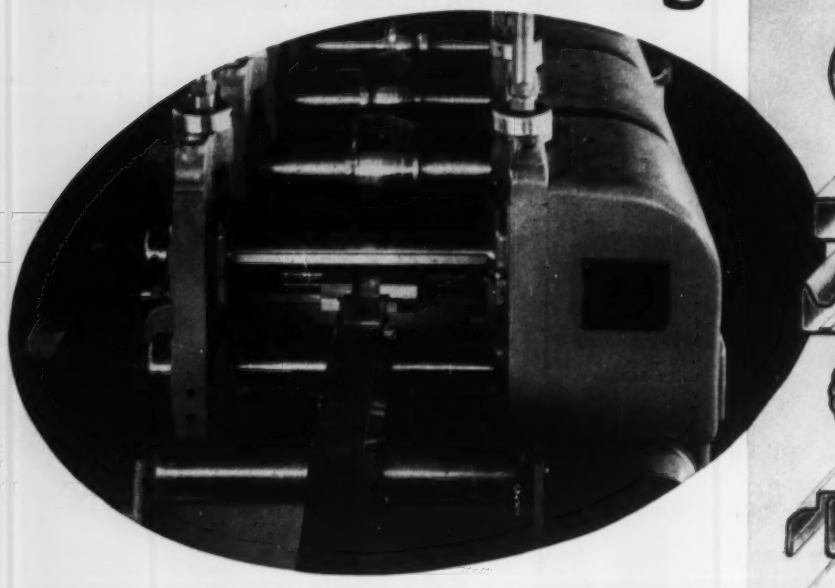
AAF

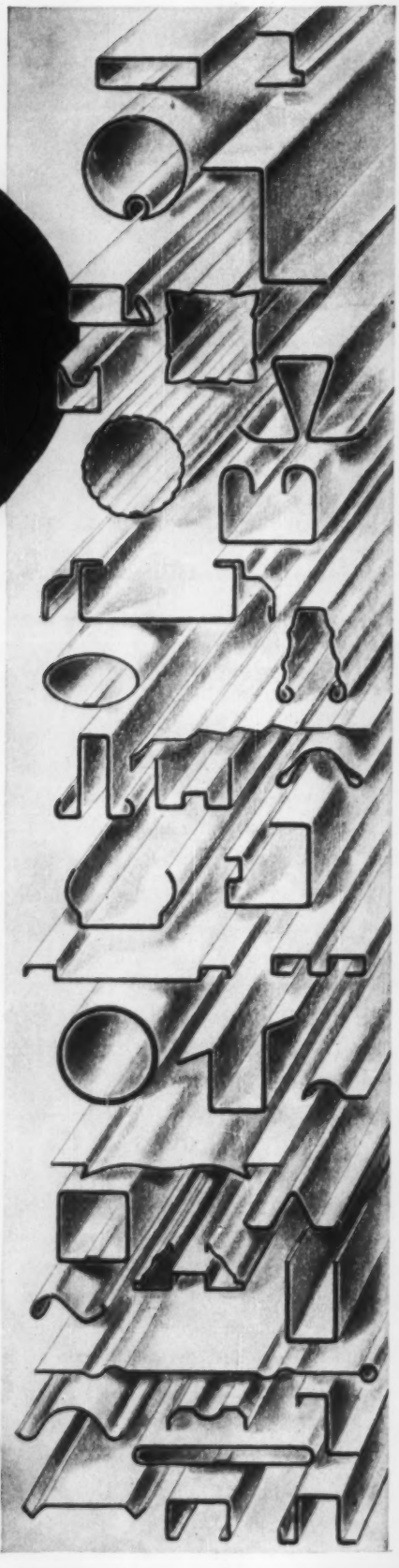
American Air Filter

COMPANY, INC.

443 Central Avenue, Louisville 8, Kentucky • American Air Filter of Canada, Ltd., Montreal, P. Q.

Cold-Roll-Forming





for *higher production,* at greatly reduced cost

If you make anything that can be cold-roll-formed in fair quantities, you may be sure it will mean either higher production or greatly reduced cost, or both. Moreover, because roll-formed shapes can be designed for highest strength-weight ratio, this method often affords material savings exceeding the entire conversion cost.

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The Yoder Book on Cold-Roll-Forming may prove of interest to you. It's yours for the asking.

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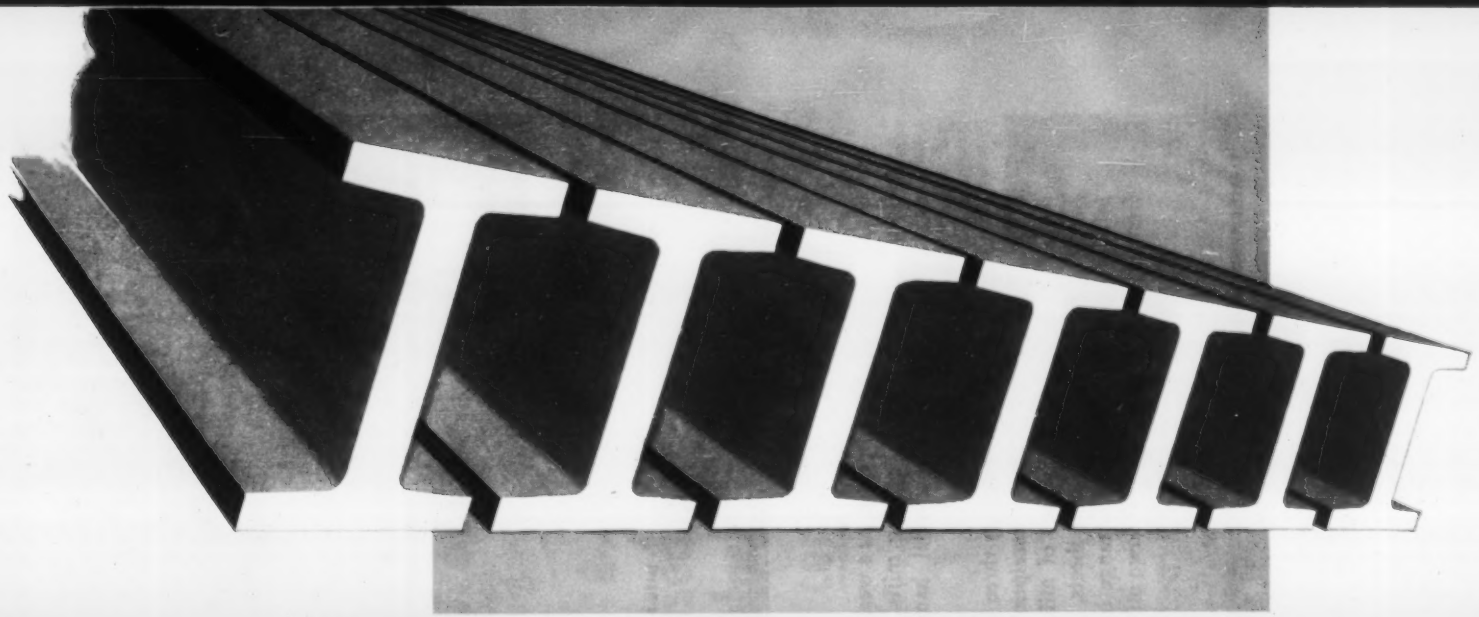

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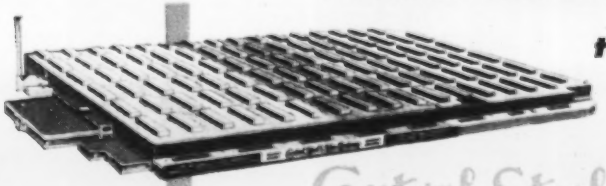

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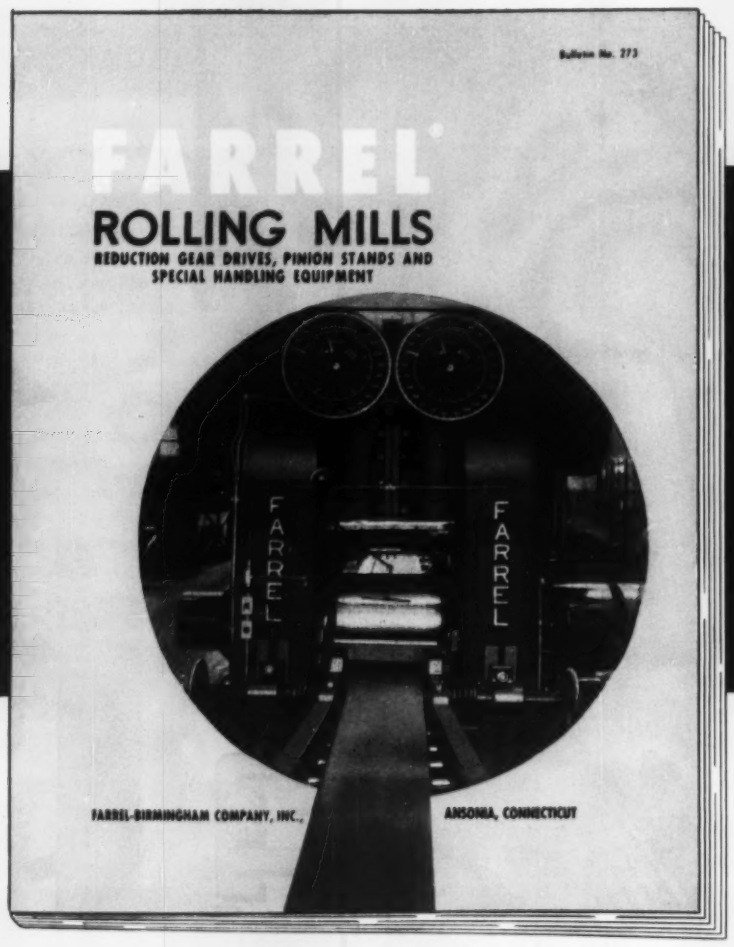

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REDUCTION GEAR DRIVES AND PINION STANDS—Under this heading you will find four pages of data on single and double reduction gear drives, pinion stands and combination units.

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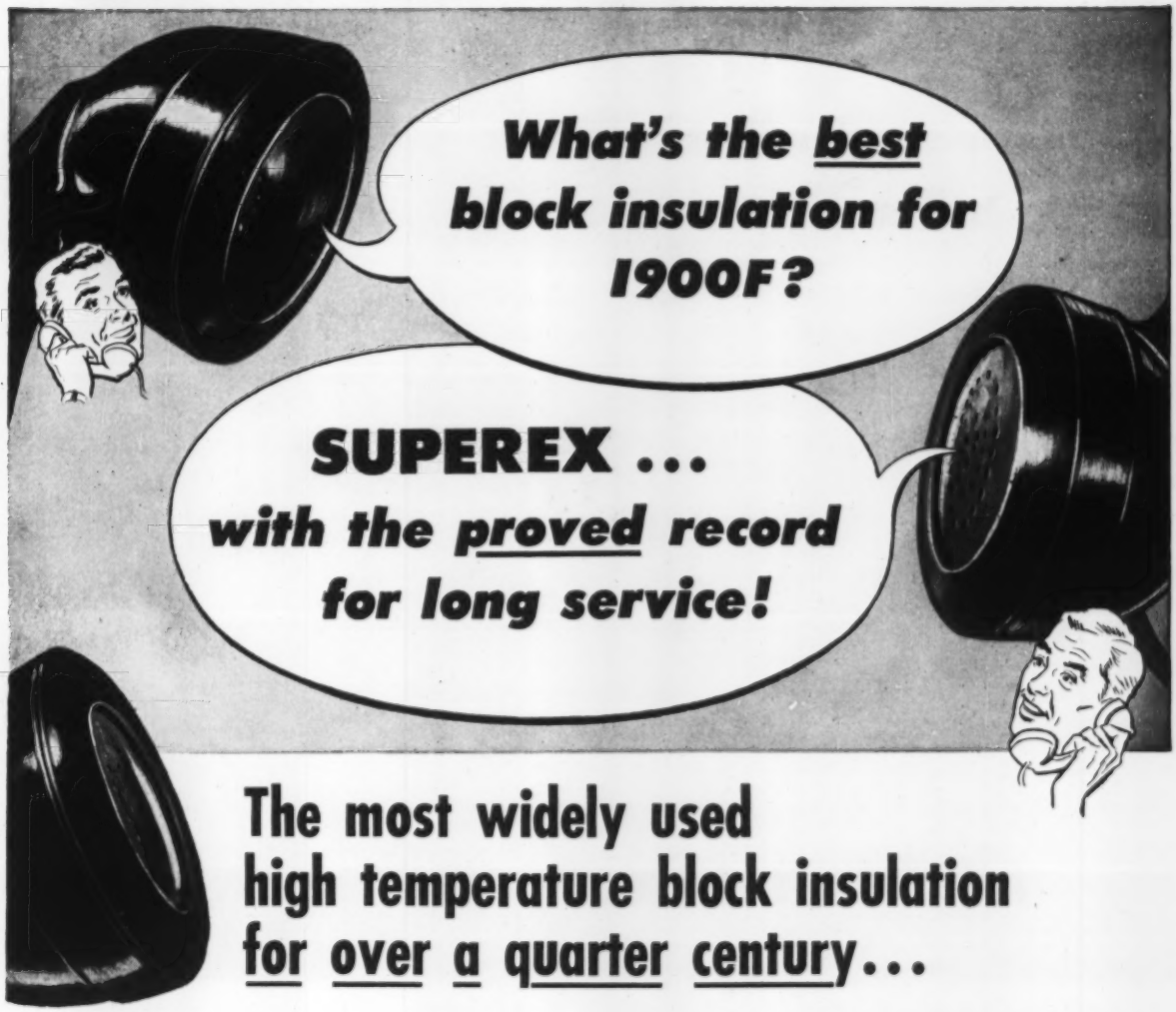

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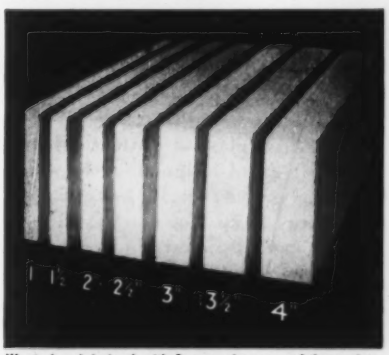
For complete information about Superex block insulation, write for Brochure IN-134A. Address Johns-Manville, Box 60, New York 16, N. Y. In Canada, write 199 Bay Street, Toronto 1, Ontario.



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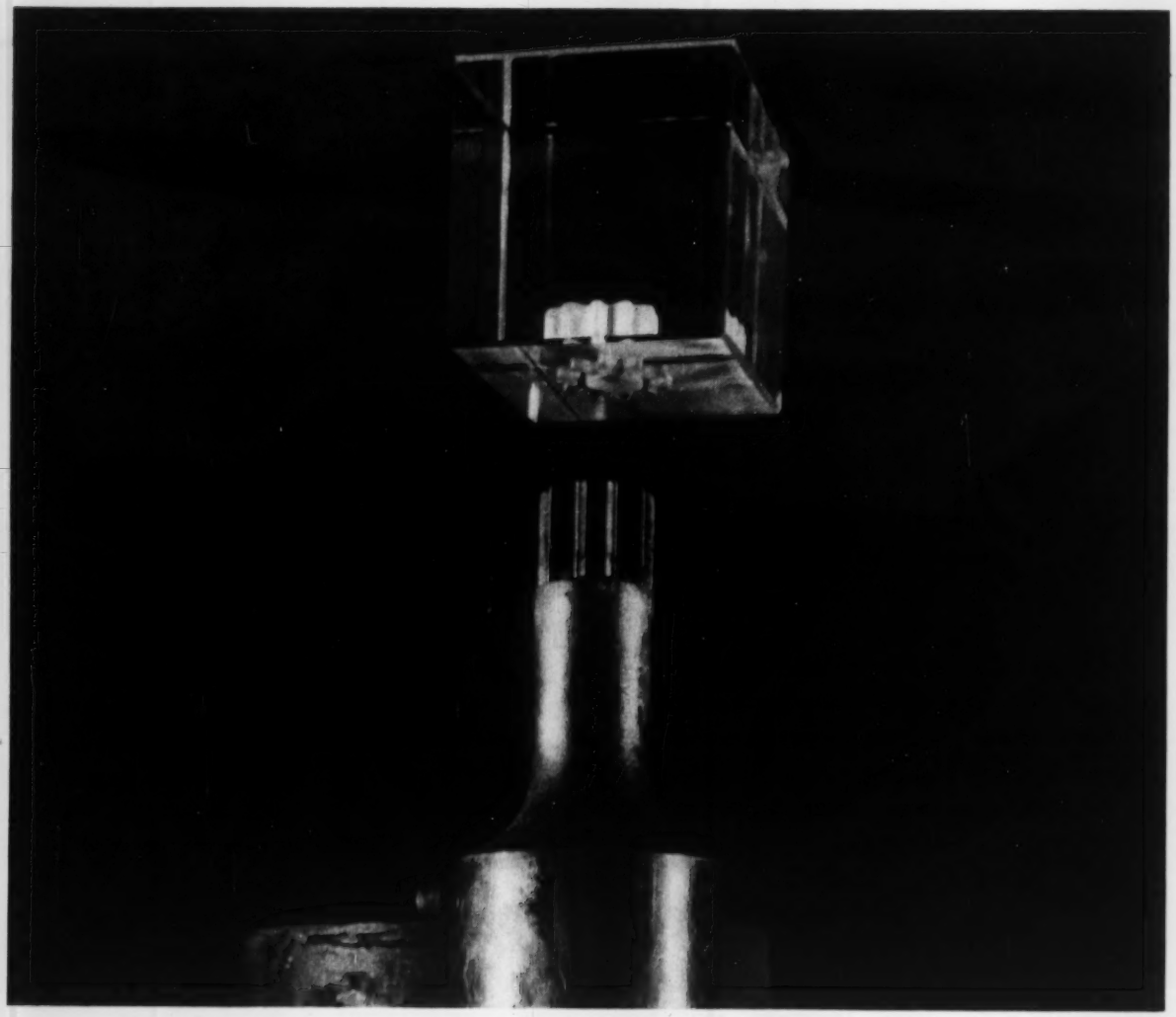

Using high-frequency vibrations and low-cost abrasives, the Ultrasonic Machine Tool carves holes and patterns of all shapes in hard-to-work materials. Development of the tool climaxed more than 10 years of research and experimental work.

How SILENT SOUNDS CUT HOLES you can't drill

This common steel gear bites its way into a glass cube as smoothly as it would mesh with its mate.

And that's *something*, for chiseling through glass is quite a trick, even with a tool designed for the job.

Yet, as you can see, it's being done right here. And the machine that does it can also sharpen the hard metal tools used to cut other metals. It can cut diamonds without the use of diamond powder. Some day, it may even eliminate the heat-generated pain caused by your dentist's whirling drill, or provide a vastly improved method for breaking up kidney- and gallstones.

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It took time to produce and control these vibrations. Over 10 years of research and trial-and-error experimentation! Then—with the help of Inco Nickel — the successful method was perfected.

Pure nickel, when placed in an electromagnetic field, contracts much more than other commercial metals, and returns to its original length. (Physicists call this "magnetostriction.") It is this motion — stepped up a hundredfold — that produces the vibrations which give the tool its bite.

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INCO

STEEL
May 3, 1954

Metalworking Outlook

Sparks Fly on GAW

The two electrical unions—IUE-CIO and UE-Ind.—are seizing upon the excellent earnings reports of General Electric Co. and Westinghouse Electric Corp. as ammunition in their current wage negotiations with the two companies. Westinghouse's first quarter net income, for example, was $26.3 million, up 55.9 per cent over the first quarter of 1953. Both companies are adamantly against and both unions appear as strongly committed for the guaranteed annual wage. If both sides still are as far apart on that issue at the end of May, look for a strike. But walkouts are unlikely on a company-wide scale at either firm. Rather, key operations would be hit; the big new Louisville appliance facilities may be the trouble spot for GE.

Some Earnings Rise

Surprisingly good earnings reports for the first quarter are turning up, amid a generally somber metalworking profits picture for the period. General Motors Corp.'s net income hit $189 million, compared to $151 million in the first quarter of 1953. Continental Can Co.'s net earnings for the first three months this year rose to $3.0 million from $2.5 million in last year's same months. Inland Steel Co. is a standout among major steel companies (p. 58) because its earnings this first quarter are better than a year ago.

The Official View

Top steel company executives are beginning to talk about the guaranteed annual wage. Inland President Joseph L. Block says that to add a new financial burden in the form of a guaranteed annual wage on top of the obligations for pensions and insurance might be the straw that breaks the camel's back. Weirton Steel Co. Vice President George T. Fonda points to the experience of the coal miners' welfare fund to show that company contributions will be forced to grow and grow. Pittsburgh Steel Co. President Avery Adams thinks the plan impractical. Steelworkers met this week to draw up GAW and other demands. Negotiations on the contract, which expires June 30, start this month. On Apr. 27 the union formally asked for parleys.

More Liberal: Progress Payments

Defense producers will be able to get progress payments on contracts for long lead-time equipment without furnishing elaborate justifications. The payments generally will not exceed 75 per cent of total contract costs or 90 per cent of direct labor and materials costs of work done under the undelivered portion of a defense contract. The new policy applies only to manufactured goods.

A Lot of Money for Defense

The effect of budget cuts for the military will not be suddenly apparent because the services have an estimated $48 billion left from previous appro-

priations. The House Appropriations Committee approved $28.7 billion for the armed services in fiscal 1955, $1.2 billion less than the President's request and $5.6 billion less than was granted in the current fiscal year. Of the $28.7 billion, $7.6 billion goes to the Army, $9.7 billion to the Navy and $10.8 billion for the Air Force.

Leasing Pays Off

Kearney & Trecker Corp. says its new machine tool leasing plan is helping to boost direct sales, too (p. 61). The practice is spreading to the textile machinery field, also. Universal Winding Co., Providence, R. I., says its leasing program is catching on, and exhibitors at the American Textile Association meeting last week in Atlantic City say renting provides a long-sought way to modernize.

Real Estate Roundup

Are you in the market to buy or build a new plant? Society of Industrial Realtors reports a strong demand for vacant industrial land, with prices rising. The market is strong for one-story factories and warehouses, but prices are stable. If you can use a multistory plant or warehouse, you can probably get a good buy because prices are weakening.

Aluminum Firms Look Around

Interest is mounting in aluminum production sites in Alaska and the Canadian Northwest. Kaiser Aluminum & Chemical Corp. is preparing plans for a "preliminary survey of a possible hydroelectrical development" in British Columbia as potential source of power for its primary production and fabricating operations already in the American Northwest. Observers point out that such a power project could also serve new facilities in Canada and Alaska. Aluminium Ltd. is already solidly established there, with its Kitimat, B. C., project scheduled for operation in midsummer. The Canadian firm just established a new international sales development unit to help increase the metal's consumption.

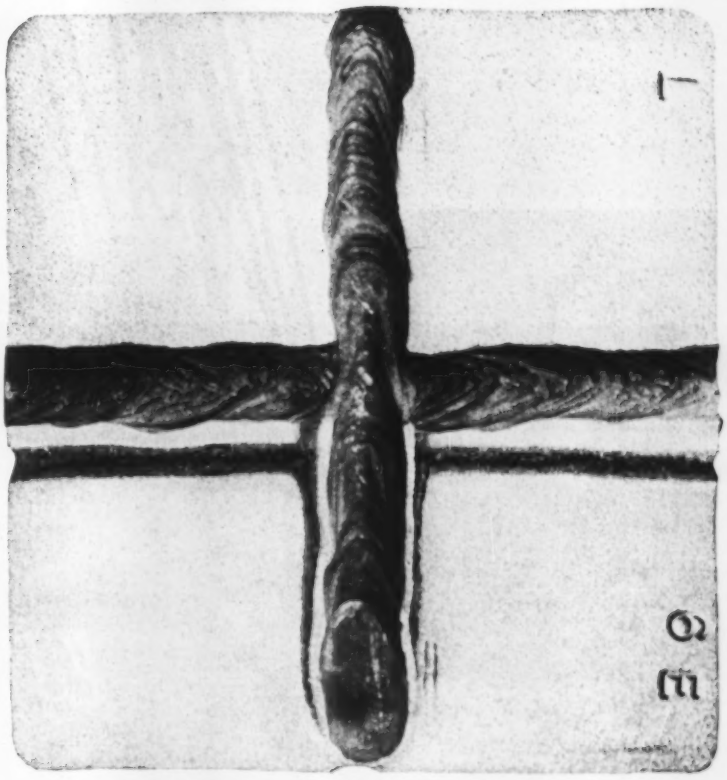
Straws in the Wind

New National Steel Corp. president is Thomas E. Millsop, replacing George R. Fink who remains a National director; Mr. Millsop continues as president of the National subsidiary, Weirton Steel Co., and Mr. Fink moves from president to chairman of another subsidiary, Great Lakes Steel Corp. . . . Office of Defense Mobilization has a plan in the works to free 10 per cent of titanium production for civilian use . . . Elgin National Watch Co. is entering the tungsten carbide field with a line of cutting and grinding tools . . . Kennametal Inc. has cut basic carbide prices 10 per cent . . . The Senate Finance Committee will start voting today (May 3) on the House-passed tax reform bill.

This Week in Metalworking

Look for an upturn in buying of steel, copper and aluminum this quarter (p. 55) . . . Automation held the spotlight at the Tool Show (p. 57) . . . Manufacturing's 1953 earnings ratio to sales continued the downtrend started in 1946, but the decline was less (p. 58) . . . Powdered metal applications soar (p. 60).

HOW ARMCO "ELC" STAINLESS CUTS COSTS IN WELDED EQUIPMENT



The effect of 6-hour immersion in a hot solution of 10% nitric acid and 3% hydrofluoric acid. On the upper portion of the sample (Armco 18-8 ELC), there is no evidence of chemical attack adjacent to the weld. The lower portion (Armco 18-8), shows severe attack and perforation. Electrode was Type 308L.

Are you buying the premium-priced stainless steel grades, Types 321 and 347? If it's simply a welding problem and the equipment operates at less than 800 F, here's how you can reduce costs.

Armco produces two extra-low-carbon (ELC) stainless steels that are completely satisfactory for service in welded equipment up to 800 F. They are:

Armco 18-8 ELC (Type 304L)
Armco 18-12 Mo ELC (Type 316L)

Armco 18-8 ELC costs less than the columbium-stabilized Type 347 or the titanium-stabilized Type 321, yet insures the same freedom from intergranular corrosion in service below 800 F as the more expensive types. The Armco ELC types are produced in sheets, strip, plates, bars and wire.

"EXTRA-LOW-CARBON" DOES IT

Armco ELC grades contain *a maximum of only 0.03 per cent carbon*. This small amount of carbon is not enough to cause harmful carbide precipitation adjacent to welds during welding. Stabilizing elements are not needed, either for shop or field welding.

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Let us send you a copy of the booklet, "Armco's ELC Stainless Steels." Or, if you want technical information for your engineers we'll send you a copy of the article, "How to Control Carbide Precipitation in Welding Stainless Steels." Just fill in the coupon and mail to us.

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EC&M Type SW *all-welded* lifting magnets have a wider and more efficient magnetic path which guarantees high output . . . what's more, they maintain it! Here's a magnet that has no bolts to stretch and cause load-limiting air gaps at the poles. Welding of both inner and outer shoes keeps the fit snug. Coil space is better proportioned because recesses for bolts are not required. On the bottom, too, Inner and outer pole shoes have no cored holes for bolt heads . . . they're of solid construction and offer greater resistance to wear.

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2708

Wage Rates Are Relative

From the early thirties until about the middle of last year almost every change in wage rates or in salaries in most industries in the United States was upward. During this period, social, economic and political conditions were such that it was only natural that compensation for work invariably should go up instead of down.

Early in 1953 a new administration took office in Washington. One of its main objectives was to institute reforms that would balance the budget, end inflation and ultimately restore the purchasing power of the dollar. The leaders of the administration discovered within a few months that their hard money policy could not be adopted abruptly without jolting the economy too severely. The desirable fiscal reform must be executed gradually and cautiously.

However, the brave effort did have the effect of calling a quick halt to inflation. Also, the end of hostilities in Korea and other factors brought about a decline in industrial production and consequently a drop in employment. Thus, for the first extended period in 20 years there are conditions under which one might expect occasional reductions in wages or salaries instead of increases.

Therefore it is not surprising that a few cuts have occurred. Members of United Auto Workers-CIO, Local 12, in Toledo, recently agreed to give up an incentive plan that probably will reduce their pay 5 per cent in order to help their employer, Kaiser-Willys Motors Inc., over a somewhat difficult period. In Kentucky and Virginia several coal mines which had contracts with United Mine Workers shut down and then weeks later reopened on a nonunion basis. This meant that the miners were working at wages at least 30 per cent below the union scale. There are other sporadic instances where pay for work has been reduced.

Of course no one likes to have his income reduced, but it will do no harm for employers and employees to be reminded again that wages are relative to other factors and that under certain circumstances a wage cut can be a corrective that in the longer term can prove to be a blessing in disguise.

E. C. Shaner

EDITOR-IN-CHIEF

SAVE MONEY ON LIGHT! Every metalworking establishment depends upon artificial lighting to such an extent that the cost of lighting maintenance runs into substantial figures. A lighting expert points out (p. 114) that by paying close attention to eight precau-

tionary measures, it may be possible to save real money on lighting.

One of these eight is a systematic plan for lamp replacement. Assume you are using 40-watt fluorescent lamps, your maintenance men are being paid $2.70 an hour and it takes 20 minutes to change a lamp. If you are pursuing the natural policy of renewing a lamp only after it has burned out, this policy is costing you $178 per 100 lamps replaced. On the other hand, if you adopt a policy of replacing all of the lamps when they have completed 80 per cent of their rated life, or as an alternative plan, when they have completed 70 per cent of rated life, then the cost will be $143.75 or $138.57, respectively, per 100 lamps.

These savings, namely $34.25 or $39.43 per 100 lamps, in many plants would run into impressive figures. Economy-minded managers might look into this opportunity to save money.

* * *

PIONEER IN RESEARCH: The foregoing tip on how one may save money on plant lighting came from Don Phillips, illuminating engineer, Lamp Division, General Electric Co., Nela Park, Cleveland. As many readers probably know, Nela Park was one of the pioneer research laboratories in the country. The half dozen or more buildings were erected more than 40 years ago in an attractive campus or park-like acreage about nine miles east of downtown Cleveland.

At that time, there were no zoning laws, and there were few residences near Nela Park. During the intervening years the surrounding area has been built up to capacity with homes, churches, schools and retail establishments. During all these years, no resident has ever complained about Nela Park as being an undesirable neighbor in the community. On the contrary, it is considered an asset and a showplace which native Clevelanders are proud to exhibit to visitors.

* * *

ENEMIES OF PROGRESS: In view of the excellent reputation which Nela Park has won during four decades, it is difficult to understand why so many people today oppose research laboratories in nonindustrial areas. During the past year scores of leading industrial corporations have sought permission from city councils to build research laboratories in areas which have been zoned for residential or institutional use.

In many cases the councilmen favor the project because they study its implications sufficiently to realize that it will be advantageous tax-wise, will bring a high type of professionals into the community and will present to public view buildings and grounds that will be more attractive than most of the premises in the community. But this attitude will not be displayed by all of the citizens. There is bound to be an eager beaver who, completely ignorant of what a laboratory is, will inflame the people with the idea that a dirty, smelly factory is to be dumped into the home section of their fair city.

* * *

IN FAVORED POSITION: The growth of research is so important, the advantages of having a research center in many enterprising communities are so attractive and the misconception of a research laboratory is so widespread that they all point to the need of a real selling job on the part of American industry. If the case of the industrial research laboratory center in a university campus environment were presented properly to the American people, there would be an almost complete reversal of public attitude.

Instead of the almost automatic opposition stemming largely from ignorance and an inborn antipathy toward anything industrial, there would be a realization that research is a powerful constructive force in the nation's destiny and that the communities which foster the advancement of research are in a favored position.

* * *

TOO FEW APPRENTICES: A perennial problem of American industry is the training of apprentices. It is an important yet complicated undertaking. If you go into it haphazardly, you may wind up with the realization that you have spent a lot of money and that many apprentices you have trained have been enticed into the ranks of your competitors.

Nevertheless, something must be done to develop more skilled workers. Government figures (pp. 65, 66, 67), which are not too accurate, indicate that the number of apprentices today does not exceed 250,000. By conservative estimate, the figure should be 820,000. This means our shortage in apprentices is 570,000. This is tremendously important.

520 CUTS

IN AN 8-HOUR DAY...

Angles, Bars, Channels and Beams

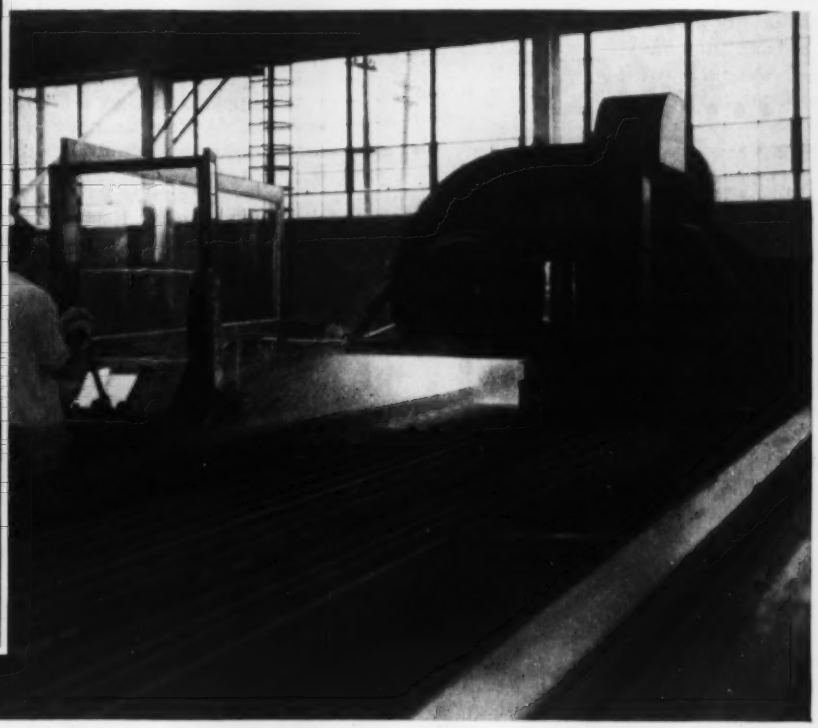
Report from
Joseph T. Ryerson & Son, Inc., Chicago; branch warehouses in principal cities.

Number of Kling Friction Saws in use
16 — among all Ryerson plants.

Jobs performed
Cutting angles, bars, channels, beams.

Average Cuts Per Day
Average 520 cuts of miscellaneous items in an 8-hour day, ranging from light channel sections to 30" x 124 lb. beams.

Other Advantages
Has reduced the amount of burr, reducing time required to chip or clean the cut.



Kling HIGH SPEED FRICTION SAWS

increase cutting production **FOR "THE BEST OF COMPANIES!"***

Greater cutting speed with all types of steel . . . versatile ability to cut many different kinds of structural shapes... cleaner cutting . . . and lower investment in initial equipment—these are some of the advantages that attract industrial plants and steel warehouses like Joseph T. Ryerson & Son, Inc.—to the use of Kling Friction Saws.

One Kling High Speed Friction Saw can handle a volume of cutting that would otherwise require several shears or other type saws. Consequently, Kling Friction Saws make possible faster cutting of structural shapes without changing set-up, than any other known process.

The reason for the exceptional speed of Kling Friction Saws is, that they operate on a principle practically the opposite of the ordinary tool or conventional saw. Friction sawing concentrates the heat on the material to be severed, at a rate which is faster than it can absorb heat. The process is not new, but has been applied successfully for years.

Following are Some of the Users of Kling Friction Saws

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To keep oil flowing at correct temperature

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Completely self-contained, all piped up and ready to operate, this De Laval Mill Lubrication System is equipped to furnish bearings with the proper amount of lubricant at required pressure.

To keep oil flowing at correct temperature and viscosity, a Ross Type CP Exchanger is furnished as a standard component. Safe, dependable cooling is always assured!

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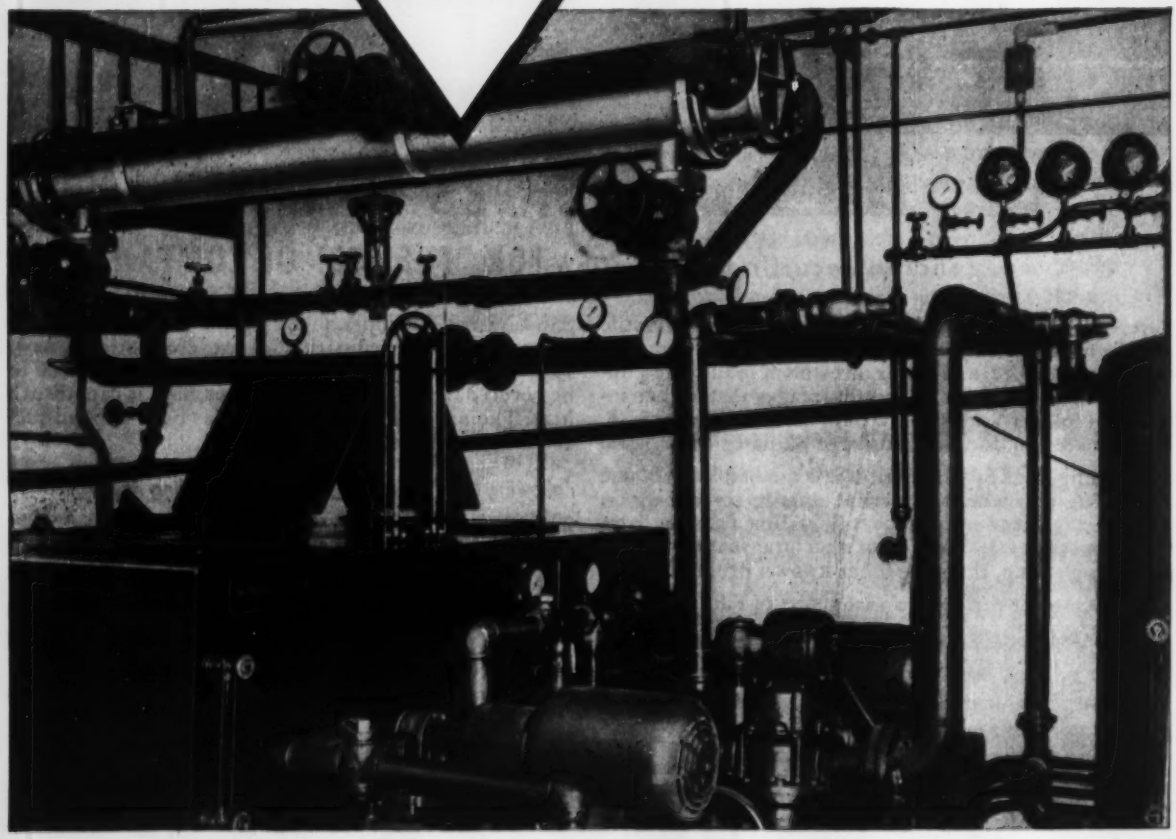

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Rise in Metals Buying Forecast

One out of three purchasing agents surveyed expects rise in steel, copper and aluminum inventories for second quarter, 1954. Midwest is stronghold of optimism

CONFIDENCE in a business pick-up later in 1954 is bolstered by results of STEEL's latest survey of metalworking's purchasing plans for steel, copper and aluminum. One-third of responding purchasing agents expect to increase inventories of those products during the second quarter, 1954.

The optimistic trend toward higher inventories anticipated by 34 per cent of the responding buyers is 9 per cent stronger than that revealed at the beginning of the first quarter, 1954. Only 66 per cent of respondents still expect that stocks will remain equal or be reduced further, compared with 75 per cent in the previous survey.

Results of this quarterly survey buttress the findings of an earlier STEEL study (Apr. 19, p. 93) which revealed steel buying on a weighted average of respondents would increase 3.7 per cent in May, 1954, over March, 1954. Then, as now, 34 per cent of the respondents expected to share in the increase.

Geographically Speaking — Anticipation of a rise in metals inventories centers in the Midwest. Almost half of the purchasing agents in that area expect to have larger stocks and this group, in turn, comprises more than half of the total number of purchasing agents expecting bigger inventories.

Rosy optimism does not pervade the entire country, however. There still are scattered inventory adjustments downward to be made. Says one firm: "Anticipated pickup in business has not materialized." Southern buyers comprise more than one-third of the group anticipating further reduction in stock.

Below Par—Responding purchasing agents indicated that inventories for 10 of the 17 metal products in the table on page 56 are considered below the ideal; six of these 10 products are cited as being in serious inventory imbalance. They are cold-finished bars over one inch, hot-rolled alloy bars, hot-rolled carbon bars under one inch, hot-rolled sheets and strip, structural shapes and seamless tubing.

While present stocks of most metal supplies are lower than they were three months ago, the countertrend toward higher inventories is already becoming apparent in eight of the products listed: Cold-finished bars over one inch, hot-rolled carbon bars under one inch, galvanized sheets, heavy plates, structural shapes, seamless tubing, stainless sheets and strip and aluminum products.

Customer Calls It—Should the tendency toward higher inventories gain momentum it can be easily translated into actual stocks. All deliveries are faster now than three months ago. As one purchasing agent put it, "We can get most any delivery requested."

And a large segment of metalworking buyers believe the requests will be for heavier shipments in second quarter, 1954.

Pittsburgh Steel Transformation Brings Balance

PITTSBURGH Steel Co. turned the page to a new chapter in its corporate history last week when it completed four years of extensive and expensive ($65 million) transformation. The 48-per-cent increase in ingot capacity and the 82-per-cent boost in finishing capacity take Pittsburgh out of the "marginal operations" classification, broaden the company's range and free it from the highly cyclical semifinished market.

Box Score—Before 1950, total annual shipments of steel products averaged 695,000 tons. About one-third of this was seamless tubes, one-third wire and the remainder semifinished steel. Big cause for concern was shortage of finishing capacity which meant that one-third of the capacity had to be marketed as ingots.

When Avery C. Adams joined Pittsburgh Steel as its president in 1950 the rebuilding plan began to take shape. Thomas Steel Co., Warren, O., was acquired in 1951

Latest Metal Supply Picture as Seen by STEEL's Quarterly Survey

(Figures are percentages of those replying to the questionnaire)

PRODUCTS	INVENTORY POSITION					BEST DELIVERY				
	Under 10 days	10-30 days	30-60 days	60-90 days	3-6 mos.	Under 10 days	10-30 days	30-60 days	60-90 days	3-6 mos.
C. F. Bars, over 1" (This quarter)	15	30	25	16	14	42	32	21	5	..
(Last quarter)	10	21	31	31	7	20	56	16	8	..
C. F. bars, under 1"	6	39	31	15	9	36	41	18	5	..
	8	20	36	24	12	14	59	23	..	4
H. R. alloy bars	11	17	39	17	16	33	34	27	6	..
	10	19	57	14	..	18	53	29	..	..
H. R. carbon bars, over 1"	8	25	42	17	8	27	37	30	3	3
	5	23	46	16	10	18	24	49	6	3
H. R. carbon bars, under 1"	5	24	39	17	15	29	42	24	3	2
	3	15	45	25	12	22	27	41	5	5
H. R. sheets, strip	5	14	42	25	14	23	26	48	3	..
	5	18	50	16	11	6	29	52	10	3
C. R. sheets, strip	9	25	33	25	8	18	36	46	..	..
	9	15	40	18	18	10	22	55	13	..
Galvanized sheets	34	12	22	11	21	52	23	25	..	..
	22	5	28	28	17	29	24	41	6	..
Plates, light	10	11	57	9	13	22	33	37	8	..
	3	22	34	33	8	13	33	33	14	7
Plates, heavy	8	17	51	8	16	18	23	50	5	4
	3	16	42	32	7	8	27	38	15	12
Structural shapes	13	20	36	12	19	14	34	38	14	..
	7	33	36	12	19	11	25	36	21	7
Welded tubing	11	26	42	16	5	37	32	26	5	..
	11	17	39	28	5	29	21	43	7	..
Seamless tubing	..	27	34	20	19	33	27	32	8	..
	4	23	32	23	18	21	32	37	10	..
Stainless sheets, strip	11	20	69	..	..	29	53	18	..	..
	20	20	40	20	..	7	50	43	..	..
Pig Iron (foundry)	12	10	67	..	11	26	63	..	11	..
	18	9	64	9	..	11	89	..	..	..
Copper, brass mill prod.	10	17	64	9	..	11	89	..	..	..
	6	13	50	19	12	21	36	29	14	..
Aluminum products	13	31	44	6	6	33	40	21	6	..
	5	35	50	10	..	11	45	44	..	..

to give Pittsburgh a door opener into the field of flat rolled steel. Then came the plant expansions: New blooming-slabbing mill, enlargement of open hearths to 250 tons each and subsequent rebuilding of entire shop, new soaking pits, hot and cold strip mills at Allenport, and other expansion.

Better Shape — Now Pittsburgh finds itself with capacity enough to produce over 1.1 million tons of finished products of which 56 per cent is in sheet steel products, 25 per cent in seamless tubes and 19 per cent in wire and wire products.

With that mix, average selling price per ton is higher and Pittsburgh's operating rate can be maintained at least at the industry rate instead of fluctuating with ingot demand.

THE BOSS ROLLER TAKES A LOOK
. . . at production from Pittsburgh Steel's new facilities

Automation Draws Tool Show Attention

Exhibitors show they can scoff at recession talk when they have good product designs that stress automaticity and that are well merchandised

AUTOMATION equipment and automatic machines and controls drew a lion's share of attention at the American Society of Tool Engineers' exposition in Philadelphia's Convention Hall last week.

Millions of dollars worth of new production equipment and manufacturing processes were viewed by 35,000 top production planners. Many of the more than 500 exhibitors featured working installations of their product. A substantial number of installations made their premier appearance at the show as exhibitors showed models which have have not yet been installed in production lines.

Running the Gamut—Automatic, multidimension gaging equipment, machines with automatic cycles and automated materials handling systems were only part of the automation picture. Much of the tooling, controls and other process components were geared to a high-production theme.

A down-to-business atmosphere pervaded the exposition hall. Show-going tourists were conspicuous by their absence. Display visitors actually were seeking new ideas on low-cost, high-efficiency production.

Business Is Good—Exhibitors with good product designs, backed by aggressive merchandising, scoffed at recession talk.

"Our incoming orders this year are running 11 per cent ahead of the comparable 1953 period," says a manufacturer of hydraulic equipment.

"Our components line is far ahead of last year," reports another manufacturer.

"This new line of heat treating equipment is getting a remarkable reception. We believe incoming orders are running 15 to 20 per cent ahead of last year."

Several gage manufacturers find new competitive conditions are forcing manufacturers to new, more automatic equipment. "Automakers are pushing us for delivery on these new models. They have to have them to keep pace with today's conditions."

JOSEPH P. CROSBY
. . . new ASTE president

Crosby Elected—New president of the association is Joseph P. Crosby, vice president in charge of sales, Lapointe Machine Tool Co., Hudson, Mass.

Scrap Freight Rates Cut

Reduction of 15 per cent in railroad freight rates on iron and steel scrap will go into effect about mid-June in Eastern Territory (east of the Mississippi river and north of the Ohio and Potomac rivers), according to Institute of Scrap Iron & Steel.

Reduced rates will be applicable to a new minimum carload basis of 80,000 lb. Rates on the present minimum basis of 44,800 lb will not be adjusted, but the Institute is working on about 300 point-to-point reductions on the 44,800 lb basis. Also to be reduced about 15 per cent are switching rates in excess of $1 per ton.

Tool Orders Up, But Not Enough

New orders for machine tools rose to $50.1 million in March, 1954, compared with $47.2 million for the preceding month. But shipments also rose, to an index of 326.3 (1945-1947 = 100) in March from 323.1 in February, says the National Machine Tool Builders' Association. Net effect is a further reduction in backlogs of machine tool builders.

NMTBA's ratio of unfilled orders to demonstrated production rate stands at 4.6 to 1 for March, lowest point since March, 1950. That doesn't mean all machine tool builders' backlogs are less than five months because some special tool or heavy tool builders still have two year's work ahead while some standard tool makers are down to two weeks backlog.

NLRB Holds 913 Elections

National Labor Relations Board during the first three months of 1954 conducted 913 elections to determine whether employees wanted union representation. Unions won out in 522 or 63 per cent of the elections. Of the 122,342 workers eligible to vote, 109,505 or 90 per cent participated, with 77 per cent of the voters favoring a union.

In the same period board members issued 63 decisions in unfair labor practice cases and 393 decisions in representation cases. The general counsel issued 144 complaints, 82 based on charges against employers, 38 against unions and 24 against both employers and unions.

Dollars for Europe's Industry

European Coal & Steel Community will use its $100-million loan from the State department to make loans to private coal, coke and iron ore companies for modernization of production facilities.

Specifically, the funds will be used to develop facilities for coal, coke and iron ore production, to provide additional housing for miners, to construct and modernize power stations at pit heads and to facilitate the economical use of low-grade coal.

U. S. took the occasion of the loan to tell the community that it is consulting with some of the member countries on the quota restrictions maintained by them on U. S. coal.

Slide in Manufacturers' Earnings Rate Continues, but at Slower Pace

(Per cent of net profit to sales after taxes, 1941-1953)

INDUSTRY	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	[illegible]
Nonferrous Metals	12.3	12.1	9.0	8.6	6.4	10.2	12.4	11.7	8.2	9.8	8.8	7.7	[illegible]
Petroleum Products	10.1	7.4	6.8	7.0	7.0	9.4	11.1	12.9	9.9	10.8	11.5	10.5	[illegible]
Autos and Trucks	6.6	5.2	3.2	3.1	4.5	3.6	6.4	7.4	8.9	8.9	5.2	5.5	[illegible]
Railway Equipment	6.6	3.2	3.1	3.1	3.9	6.0	6.1	5.4	4.4	5.5	4.8	3.8	[illegible]
Iron and Steel	6.2	3.4	2.8	2.6	3.0	5.6	6.2	6.7	7.2	8.1	5.8	5.0	[illegible]
Aircraft and Parts	7.4	3.2	1.8	1.2	1.2	0.5	4.0	1.4	3.3	4.5	2.2	2.4	[illegible]
Total Manufacturing	6.5	4.3	3.6	3.3	3.9	6.0	7.1	7.5	6.8	7.7	6.2	5.4	[illegible]

Source: National City Bank of New York, "Economic Conditions," April of each year, 1942—1954.

First Quarter Steel Profits Dip Less Than Sales

PROFITS DROPPED for the steel industry generally in first quarter, 1954, from the same period a year earlier, but they didn't take as big a dip as dollar sales.

For example, U. S. Steel Corp.'s sales dropped 10.5 per cent in 1954's first quarter from a year earlier, but net income dipped only 9.2 per cent (see the table). Republic Steel Corp.'s first quarter, 1954, sales went down 27 per cent from the year earlier period while the company's net income slipped only 19.5 per cent.

Two Cushions—One big cushion under slipping net income was elimination of excess profits tax, beginning in January, 1954. Another cushion was reduction of some high-cost factors of operation such as overtime payments.

First quarter, 1954, may not be the low water mark in steel ingot output, says Benjamin F. Fairless, U. S. Steel chairman, though *steel buying* is slightly on the uptrend. Mr. Fairless says U. S. Steel's first quarter output averaged 80.8 per cent with current operations running at about 70 per cent. Second quarter average output, both for U. S. Steel and the industry, should be slightly in excess of the 70 per cent mark, predicts Mr. Fairless. Inland Steel Co. had a 96 per cent ingot rate in the first quarter, standout performance for the large steel companies. Inland Chairman Clarence B. Randall was "hopeful" that rate could be sustained in the second quarter.

Spotty Returns—The table below reveals a wide variety of performances for first quarter, 1954. The picture of income down but not as much as dollar sales is true generally for the industry.

Jones & Laughlin Steel Corp.'s rise in net income can be explained largely by a changeover in accounting methods whereby the company deferred some tax reductions in first quarter, 1954. Pittsburgh Steel Co.'s net loss is explained as resulting from heavy starting-up expenses on the company's new 66-inch cold-rolled sheet mill (see p. 55).

Sales and Income of Selected Steel Producers

	Net Sales 1st Quarter*		Net Income 1st Quarter	
	1954	1953	1954	1953
U. S. Steel Corp.	$830,826,211	$927,925,909	$44,830,376	$49,375,952
Bethlehem Steel Corp			27,802,938	30,961,033
Republic Steel Corp.	214,469,708	292,918,852	11,079,012	13,779,049
Jones & Laughlin Steel Corp.	127,880,000	158,914,000	5,821,000	5,642,000
Youngstown Sheet & Tube Co.	105,863,413	140,564,614	2,998,478	6,958,975
Armco Steel Corp.	131,346,000	143,397,000	9,137,226	7,767,045
Inland Steel Co.	138,682,070	135,855,115	9,463,250	6,805,150
Colorado Fuel & Iron Corp.			771,456	2,177,372
Wheeling Steel Corp.	42,018,378	53,002,824	1,135,386	2,962,388
Pittsburgh Steel Co.	28,767,786	39,687,252	—199,150†	1,971,820
Crucible Steel Co. of America			529,926	1,756,829
Granite City Steel Co.			748,186	1,344,746
Allegheny Ludlum Steel Corp.	45,614,000	68,686,000	1,063,000	2,098,000
Copperweld Steel Co.	12,416,580	24,303,806	282,347	994,550
Detroit Steel Corp.	11,985,901	28,803,509	—237,980†	1,692,546
Rotary Electric Steel Co.			516,202	728,857
Carpenter Steel Co.	10,352,365	14,144,021	504,340	901,872

* Includes other revenues in some cases † Net loss

More Steel, Fewer Furnaces

The rapid increase in the nation's steelmaking capacity in recent years has been accompanied by an even greater rise in average capacity of furnaces, according to American Iron & Steel Institute.

Total annual capacity of open-hearth furnaces rose 30 per cent to 109 million net tons from 1945 to Jan. 1, 1954. In this same period, number of open hearths was reduced from 990 to 934, reflecting a 37-per-cent boost to 160 tons in average furnace capacity per heat.

Republic Steel Looks Ahead

Republic Steel Corp. has taken significant steps into two fields of activity with promising futures: Application of atomic power for steel making and titanium ore extraction.

In the first case, Republic engaged Dr. Robert P. Petersen—chief of Industrial and Production Reactors Branch, Division of Reactor Development, Atomic Energy Commission—to study and develop use of nuclear materials in operation of steel plants and in production of steel in general.

Republic also has acquired what is estimated to be one of the largest deposits of rutile (ore from which titanium is extracted) in the southern part of Mexico about 30 miles from Port Angelo on the Pacific coast. C. M. White, Republic president, says the company will probably contract for concentration of the ore to titanium sponge and may also offer the ore for sale.

Aircraft Profits Grounded

Airframe makers' sales are excellent, but earnings lag behind other industries'

THE NATION'S 12 leading airframe manufacturers in 1953 had their best year, profitwise, on record, according to an Aircraft Industries Association survey.

Earnings reached $116.6 million after payment of $200.5 million in federal taxes. In 1952, the next best year, earnings were $81.7 million and federal taxes, $138.8 million.

Despite this increase in earnings the 1953 earning rate compared to sales was 2.3 per cent, less than half the national average of 5.3 per cent for all manufacturing industries, as reported by National City Bank of New York (see the table on page 58).

Postwar High—Sales of the 12 companies hit $5.1 billion for the year, a figure exceeded only by war years 1943 and 1944 when sales were $5.2 billion and $5.7 billion respectively. The 1953 total was more than a third higher than 1952's $3.7 billion and almost 10 times the postwar low in 1946 of $519.0 million.

Prospects for the airframe companies, at least for the coming year or two, continue bright. Unfilled orders amount to $11.6 billion, substantially over the backlog of about $11 billion reported a year ago. AIA says, "Although this backlog would provide for about two years' operations at the present volume, it is anticipated that there will be a gradual decline in production and consequently in sales and earnings beginning in 1955."

Big Risks—AIA also points to "tremendous risks that accompany the production of military aircraft." It cited the example of a major airframe company that last year lost 22 per cent of its net worth when a single contract was terminated.

Another problem for the companies is the need "to invest tremendous amounts of money in test facilities" to stay in the running for military design competition. Before the war only limited test facilities were needed.

Bethlehem Steel

Screw Machine Parts Makers Measure Their Future

A BUSINESS DIP is when you tighten your belt; a recession is when you have no belt; a depression is when you have no pants.

Jobbing manufacturers of screw products differ as to which category they're in, but they agree their business may be 35 or 40 per cent down in 1954 from the estimated $550 million done by commercial shops in 1953 and the $543 million in 1952.

"We're in a dip," says W. N. Grass, president of M. J. Grass Screw Machine Products Co., Buffalo, who was elected president of the National Screw Machine Products Association at its annual meeting in Detroit. The sentiment of members and speakers at the meeting was: "We've had these dips before. From that experience, what can we do to cushion this one?" Here are suggestions:

- Survey your markets. Use your company, association or government statistics to learn where the bulk of customers or potential customers are. Don't go too far from home to get business.
- Survey your customers. If you make components, know the technological changes coming in the end product. Know your customers' seasonal buying habits and pick customers that will give you a steady volume. Know the minimum volume you can sell to make a profit.
- Analyze your sales management. Are all your salesmen earning their keep? Are you advertising enough?
- Know your break-even point.
- Keep labor costs segregated according to clerical, blue-collar and supervisory help to learn if indirect labor or unnecessary overtime costs are eating profits.
- Use this lull to examine all operations. Make cost figures more detailed. Catch up on postponed maintenance work.
- Take another look at secondary and supplementary operations. Those are often given little attention.
- Check your salary schedules. When companies run into difficulties, they begin looking for new management. Your personnel may be ripe for a move if salary levels are inadequate.
- Re-examine your pricing techniques. You may be able to lower some quotations.
- Keep estimating records if you do business that way. Use them in making new estimates and never let your competitor do your estimating for you.

National Cash Register Co.

Presses like these turn out more than 750,000 parts a week as . . .

Powdered Metals Take on a Man's Job

Some $300 million worth a year are now being used by industry as powder metallurgy grows into a promising manhood. New applications climb

ANY GADGET-SEEKERS who showed up at the tenth annual meeting of the Metal Powder Association in Chicago last week were in for a disappointment.

Parts on display and equipment exhibited for making them were a sober reminder that powder metallurgy is a high-speed process that turns out hard working parts.

Fast Growing—That's why the metal powder business is one of the fastest growing industries. Five years ago, the U. S. was consuming about 1 million pounds of iron powder per month. In 1953, average monthly consumption was 2,203,180 pounds. More than half of it went into the manufacture of bearings and parts and the balance into friction materials, electronic applications and other uses.

Copper powder is now used at the rate of 2 million pounds per month, almost twice as much as five years ago. Principal applications: Self lubricating bearings, mechanical parts and friction materials.

Will Uses Keep Up?—Some 20 producers now turn out powder metallurgy grade metal powders in this country. Experts say that production of iron powder exceeds present demands by a sizable margin. For example, the new plant of Hoeganaes Sponge Iron Corp., Riverton, N. Y., is designed for capacity of 5 million pounds of iron powder per month.

The military has been keeping a close eye on the industry since the end of World War II and is now using metal powders to make rotating bands for high velocity shells and other parts in fuse and fire control mechanisms. In case of war, an all-out effort in rotating bands alone would soon wipe out any surplus capacity.

Promise—But pm fabricators are quick to say that the most promising potential is in parts for consumer goods where low cost, elimination of machining, scrap saving, high production rate, close tolerances and tailored mechanical properties are big plus factors.

Today's total output comes from 100 companies who make parts for their own products and for other manufacturers or both.

New Applications — Yale & Towne Mfg. Co.'s Powdered Metal Products Div. sales manager, M. W. Isaacson, told STEEL, "Dollar volume is running 15 to 20 per cent under last year due to military cutbacks, a slump in television and reduced auto schedules. But new applications are being tested at a faster rate than ever before. We feel that powder metallurgy will thrive in the competitive times ahead."

Amplex Div., Chrysler Corp. had over 200 different parts on display, demonstrating average savings of 40 to 60 per cent over parts fabricated by conventional machining methods. For one slotted part savings ran as high as 96 per cent.

Paul E. Weingart, American Metal Co. Ltd., New York, was elected president Metal Powder Association for 1954-55. Wm. E. Cairnes, Radio Cores Inc., Oak Lawn, Ill., was named chairman of the board. Robert L. Ziegfeld was re-elected secretary-treasurer.

More 'Sell' Will Head Off the Business Decline

TOUGHEN your selling muscles to fight the declining business trend. Plenty of purchasing power and the human desire to own are twin factors to aid you.

That's what Judson S. Sayre, new vice president, Borg-Warner Corp., Chicago, told a "More Jobs through Better Selling" symposium at the U. S. Chamber of Commerce convention in Washington, April 26-29.

Keep Practicing—The big need for selling, he said, is to revive the almost forgotten art of training salesmen. "Hard practice in selling, as in baseball, is required if you are going to keep on top." Business firms failing to conduct retraining programs, so that salesmen will have full knowledge of the products they sell, will get left behind.

Herman Nolen, vice president, McKesson & Robbins Inc., New York, told the C of C members that all that's required in 1954 to "more than offset" the reduced federal government spending is an increase of 1½ per cent in consumer spending.

Co-operate—He urged manufacturers to increase sales by supplying their wholesalers with promotional material to be forwarded to retailers. In all cases, the wholesaler should be backed by the manufacturer's advertising.

Sales Forecasting Formula

Drug producer's technique can work for metalworkers too. Here are the steps

DEPENDABLE SALES forecasting is the hub of product planning and control.

That's the premise upon which Eli Lilly & Co. operates to: 1. Keep its products always available to consumers and 2. keep faith with employees by providing steady year-'round employment. The company is not a metalworking firm, but its techniques, described last week at American Management Association's meeting in Cleveland, are applicable to almost any industry.

The Factors—First forecasting step of Eli Lilly is to study past records of sales and the business situations and circumstances under which they were obtained. Step two is to study the size of the market to obtain a picture of the company's share of the total market.

Eli Lilly pegs its forecasting methods to consumer personal disposable income and has concluded that for every 10 per cent growth or decline in this income, sales of the drug product industry increase or decrease 5 per cent.

Arithmetic—Thus, sales of the entire industry are forecast by multiplying the consumer disposable income (weighted) by an estimated time trend in sales plotted from past records. Company sales are determined by multiplying the industry volume times the factor representing the company's time-trend share of the market.

"Forecasts of company sales, made a month or two before the beginning of each year, have been within 2 per cent of actual sales 13 to 14 months later," officials said. Estimates get more accurate as "we become more objective and less subjective."

New Product Forecasting—New product sales forecasting is more subjective. A new product is evaluated in terms of total market and sales possibilities. One or more of these approaches is used: 1. Estimate share of national market, 2. comparison with similar products, 3. comparison with competing products, 4. study of the trend for use or need of the product.

With dependable forecasting, officials relate, the sales projection can be molded and fitted to production to comply with the requirements of a stable work force, seasonal trends, economical lot sizes, and inventory standards. And it is flexible enough to permit prompt addition of new items.

Leasing Pays Off

Kearney & Trecker's renting plan has boosted sales, says company's president

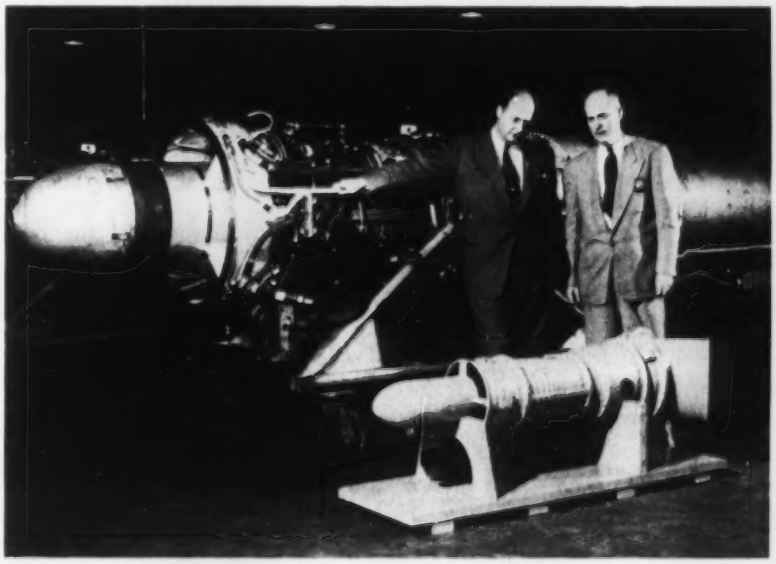
LEASING of machine tools by Kearney & Trecker Corp., Milwaukee (See STEEL, Apr. 12 p. 51), has resulted in an increase in outright sales, reports Francis J. Trecker, president.

Leasing agreements of more than $1 million were closed in the short time since the program started, Mr. Trecker told industrialists at the New England Council Industrial Opportunity Conference, Boston. Leasing negotiations for another $1 million are in progress, and sales are about $2 million.

Remove the Penalty — Also at the conference, Alfred V. Bodine, president, Bodine Corp., Bridgeport, Conn., said the government should remove the penalty on modernization it now exacts. The use of depreciation as a taxing device often results in postponement of modernization and should be done away with. Incentive taxation is not the remedy, according to Mr. Bodine. The remedy is simply one of removing the penalty by the government.

In speaking about modernization, Henry A. Sharpe gave reasons why partial modernization often falls short of desired increased efficiency and lowered costs. The president of Brown & Sharpe Mfg. Co., Providence, R. I., said older machines often cannot keep pace with the new, either in quantity or quality. Once a decision to modernize is made, says a major surgery job is often best.

Draper Corp., Hopedale, Mass., told the conference about its program for controlled replacement of equipment. Long-range planning is possible through an annual equipment survey in all departments prior to budget estimates and by thorough investigation of all suggestions from the production line.



For Helicopters: Baby Brother of Sabre Jet Engine

Mockup of General Electric Co.'s new aircraft gas turbine developed for helicopter applications sits in front of "big brother" J47-17 jet engine which powers North American's F-86D Sabre. Small engine is about the size of an automobile's unit but will be six to eight times more powerful. It can be adapted as either a turbo-prop or turbo-jet to power fixed-wing aircraft

By E. C. KREUTZBERG *Washington Editor*

Ceiling on Personal Income Tax? Idea Lacks Political Sex Appeal

THE OLD SAYING that it's easier to get rid of the seven-year itch than a tax once imposed came to mind last week when a Senate Judiciary subcommittee held a hearing on the constitutional amendment proposal to set a 25-per-cent personal income tax ceiling.

From the tenor of the testimony, it seems unlikely that the proposal can muster sufficient support to get it through this session of Congress. The chief opposition came from one of the country's big businessmen, Secretary of the Treasury George M. Humphrey.

The Difficulties . . .

"Adoption of a 25-per-cent tax rate on big incomes," said Mr. Humphrey, "would necessitate a reconstruction of the federal taxes . . . A financial breakdown could easily result." His attitude well may mark the death of the proposal because U. S. income tax collections must remain large for as far ahead as can be seen. Heavy armament expenditures appear to be on a near-permanent basis.

In addition, the 25-per-cent tax limit lacks political sex appeal. In the past 15 years, 27 state legislatures have petitioned Congress in favor of a 25-per-cent ceiling, but seven of those later rescinded their actions. So the proposal at this time is at least 12 states short of the 32 needed to launch a try at a constitutional amendment.

The Argument . . .

The chief argument for a limit on income taxes is that the present rate on big incomes discourages economic expansion. It takes an investment of from $8000 to $20,000 to create a job in a factory, and the biggest source of risk capital in the past has been the big income earner. Because of taxes, that big earner is fast disappearing.

STEEL checked with the Treasury department to determine just how much of the big income actually is taken by the federal government. It found that on the average a single person with a $50,000 annual income and no dependents is paying 52.8 per cent of that income for the year 1953. The married man with a $50,000 income in 1953 and with two dependents is paying 37.8 per cent. The average actual tax of a 1953 income of $500,000 is 85.9 per cent for a single person and 80.5 per cent for a married person with two dependents. The actual tax paid by a person, single or married, with or without dependents, who earned $1,000,000 in 1953 is 87 per cent.

NEA

REP. CHAUNCEY W. REED
. . . wants income tax limit

The Proponents . . .

The leading proponent in Congress for the tax limit is Rep. Chauncey W. Reed (Rep., Ill.), chairman of the House Judiciary Committee. Sen. Everett M. Dirksen (Rep., Ill.) is also enthusiastic, recalling that Karl Marx in his Communist Manifesto proposed heavy income taxes as one method to destroy the capitalistic system.

On the other hand, Sen. Harley M. Kilgore (Dem., W. Va.) and others contend that the proposed amendment would provide "short roads" to either Communism or Fascism. An AFL spokesman opposes the idea on the ground that it would lead directly to imposition of a federal sales tax.

The Bill . . .

Mr. Reed's bill amends the constitution so as to limit congressional authority to levy income taxes on both individuals and corporations at rates in excess of 25 per cent. The 25-per-cent ceiling could be exceeded for a year at a time only by a three-fourths vote of both houses of Congress and only if the maximum rate in excess of 25 per cent does not exceed the lowest rate by more than 15 percentage points. For example, if Congress fixed the lowest rate at 20 per cent the maximum rate could not exceed 35 per cent. Under this resolution, Congress also would be deprived of the power to impose death and gift taxes; these would be left to the states.

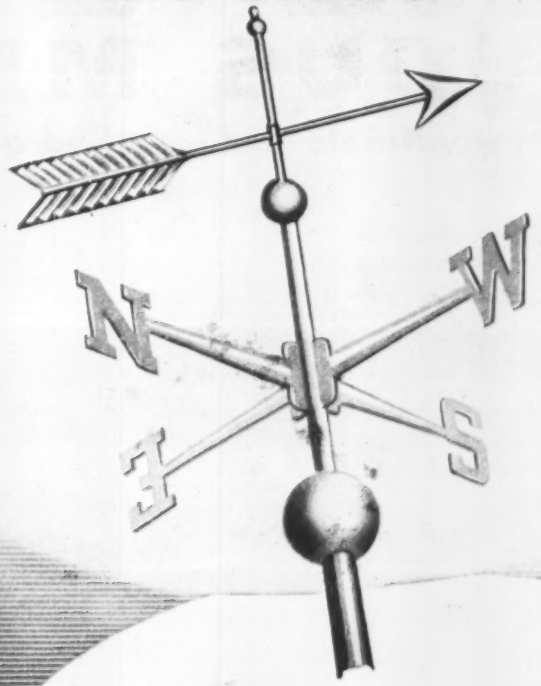
The Other Measures . . .

Two other measures have also been introduced on the same subject. They are more restrictive than Mr. Reed's bill and thus have even less chance of passage.

One proposed piece of legislation would amend the constitution so that the maximum aggregate rate of all taxes (including death and gift), duties, and excises "shall not exceed 25 per centum," except that in a war Congress by a three-fourths vote could exceed the 25-per-cent limit for a year at a time.

Another would deprive Congress of all power to levy income taxes except during a national emergency, or solely to reduce public debt and pay interest on such debt.

...whichever way the wind blows



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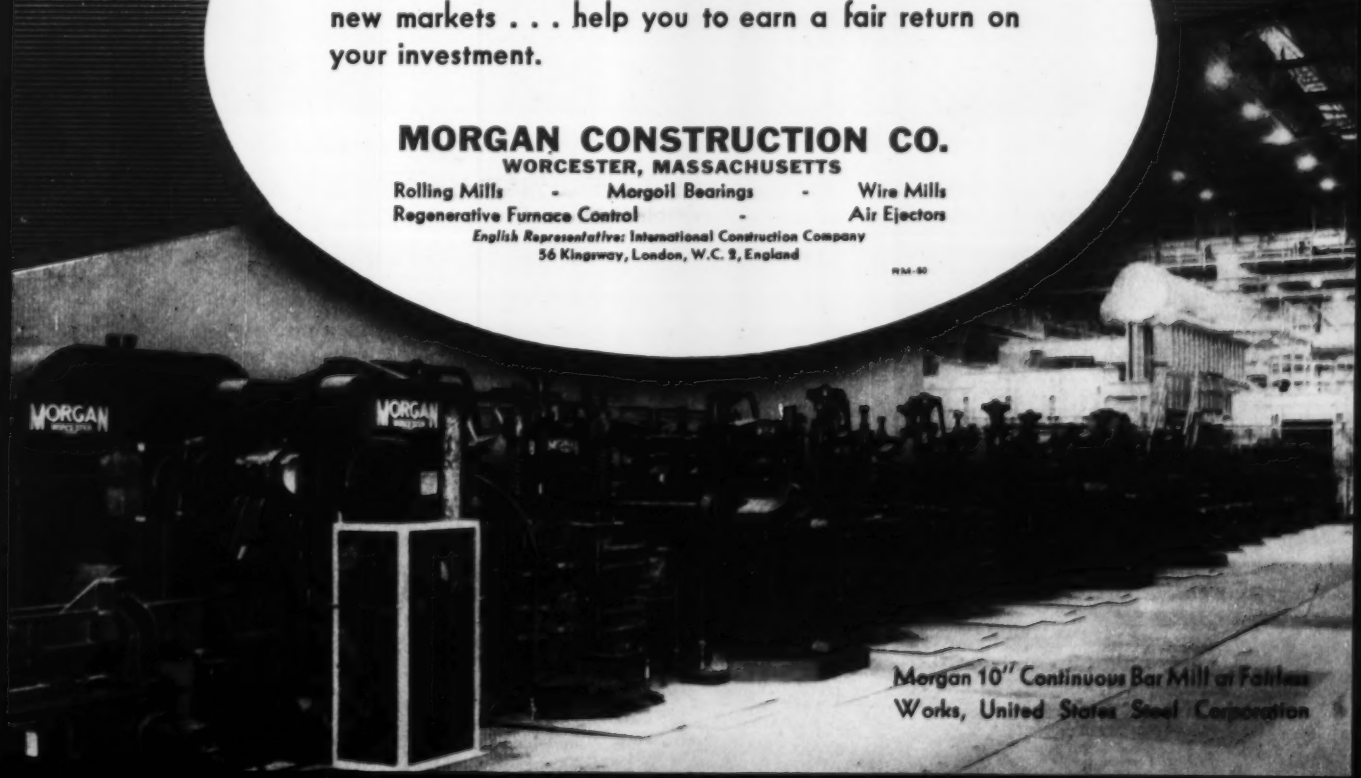

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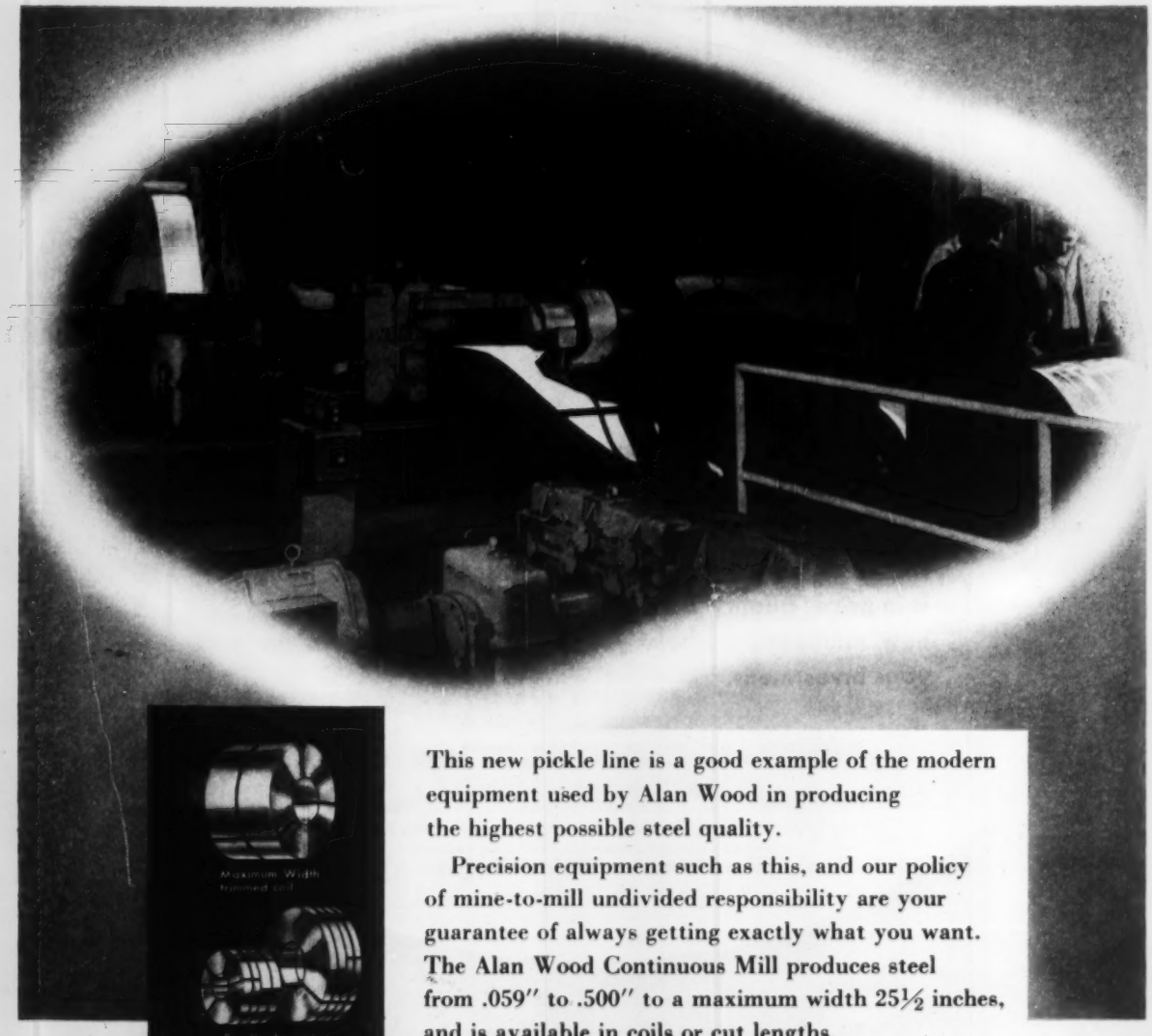

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This new pickle line is a good example of the modern equipment used by Alan Wood in producing the highest possible steel quality.

Precision equipment such as this, and our policy of mine-to-mill undivided responsibility are your guarantee of always getting exactly what you want. The Alan Wood Continuous Mill produces steel from .059″ to .500″ to a maximum width 25½ inches, and is available in coils or cut lengths.

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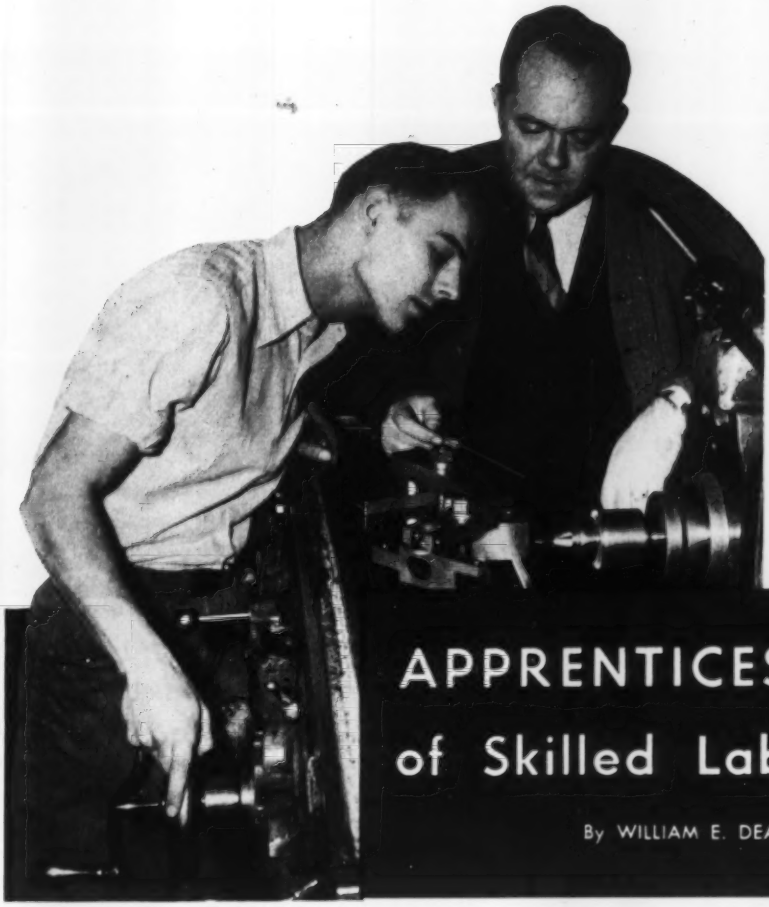


Thompson Products Inc.

Bureau of Labor Statistics figures indicate industry is short at least 570,000 apprentices to maintain current skilled labor status. Here are the factors involved and what can be done about . . .

APPRENTICES: Assurance of Skilled Labor Tomorrow

By WILLIAM E. DEAN, Assistant Editor

WANTED: Die sinkers, toolmakers, machinists, electricians. Metropolitan newspapers are filled with these ads, yet unemployment is over 3.7 million.

Why this paradox? No fisherman would head for his favorite reef unless he had his bait as well as the right tackle. But many industry executives are buying new equipment, expanding operations and setting future goals with all needs carefully planned for, except one—skilled labor.

Today's Picture—Statistics prove it. Registered with the U. S. Bureau of Apprenticeship are approximately 166,800 apprentices; there are perhaps another 50,000 to 75,000 apprentices not registered. But the total in all probability does not exceed 250,000. Compare this with 8.2 million, the number of skilled workers in the nation, according to the 1950 census. Even if the 1:10 apprentice-to-journeyman ratio, which many feel is adequate, were applied, we are still short 570,000 apprentices today.

Why isn't more action being taken? Here are the alleged reasons: "Apprentice programs cost too much." "Programs interfere with normal operations." "We can't get enough qualified applicants." "We train them and other companies buy them away from us." "We've always managed to get a journeyman when we needed one."

Forward Look—But a few forward-thinking manufacturers are taking a long-range view of their skilled labor requirements. Ford Motor Co., after a comprehensive study of its skilled labor situation, increased the number of trades in which it conducts training from 11 in 1942 to 24 today. In the last few years it has increased the number of locations where training is offered from 2 to 13 company plants. General Motors Corp. has boosted its number of apprentices from 1500 to 3000 since 1950. John Volkert Metal Stampings Inc., New York, a small 140-employee plant is planning to increase its number of apprentices from 6 to 12 or more.

Apprenticeships are the best-known method of training skilled workers. And the skilled labor supply should be of vital concern to every executive.

Who'll Administer — How the program should be administered—joint union-management or management alone—gets plenty of fire. A STEEL survey shows you can take your choice. Ford has conducted an organized apprenticeship program continuously since 1915 and for the past 12 years has operated the program with the assistance of a joint union-management committee. Ford feels that the majority of union officials connected with the program have, by recognizing the need for long-range planning, contributed to the success of the program. GM adminis-

ters its program with the union participation related to issues involving the effect of the employment of apprentices on the employment of journeymen. American Steel & Wire Division, U. S. Steel Corp., has been operating a successful apprentice program without union participation since 1924; however, wage scales and training time are stated in the collective bargaining agreement.

If you think you're too small to carry a full apprentice load, perhaps the Cleveland electrical building trade plan may spark some cooperative thinking. An area committee composed of contractors and union representatives has charge of the apprentices. Related training is given the apprentice at the Cleveland day trade school. Practical training is gained by rotating apprentices from contractor to contractor each six months. Not only does the contractor not have to carry the full load of an apprentice program, but the apprentice is rotated according to contractor specialties so that he gets well-balanced training in all phases of his trade.

Government's Part—Government help is available too, although a frequent criticism is made that "standards of the Bureau of Apprenticeship don't fit our requirements." William J. Moore, assistant director who consults with steel, foundry and auto industries in setting up programs, has this to say: "The bureau's job is strictly one of assistance. Our recommended standards are those which have been developed through experience. We would be happy to help establish a set of standards suitable to meet the requirements of any industry which wants to set up apprentice training."

Lethargy — that's probably the biggest factor in the current lack of apprentices. Prime example is the recent survey sponsored by the Cleveland Board of Education. The school board has the money and building site for a new vocational school. It sent out questionaires to over 100 major companies in the area seeking recommendations to help set up a program designed to fit the needs of local industry. Courses given in public vocational schools to apprentices and workers

Fansteel Metallurgical Corp.

Industrywide or by individual companies—

FIGURING APPRENTICE NEEDS IS SIMPLE ARITHMETIC

1. Start with the average number of skilled workers you require for normal operations and . . .
2. Subtract the average number of skilled workers you lose each year from *unavoidable causes*: death, retirement, promotion or transfer to other jobs. This gives you the average number of replacements you'll need to maintain your present skilled work force status.
3. Assuming that you are going to supply your own needs through an apprentice program, you'll need to determine how many apprentices you must have in training at all times to get the required replacement figure. *Not all apprentices complete their training*, so . . .
4. You must consider these factors when setting up your program:
   (a) What proportion of apprentices will complete their training,
   (b) What is the average time required to complete the course,
   (c) How much time in the course does the average "drop-out" spend before leaving the program?

Suppose your company followed the national average: 1 out of every 4 apprentices quits, average training time is 4 years, and "drop-outs" follow this ratio: 30% 1st year, 30% 2nd year, 28% 3rd year, 12% 4th year. To get 100 graduating journeymen per year, your training chart would look like this—

1st YEAR		2nd YEAR		3rd YEAR		4th YEAR	
START	FINISH	START	FINISH	START	FINISH	START	FINISH
134	119	119	109	109	103	103	100
		134	119	119	109	109	103
				134	119	119	109
						134	119
							431

You would need 431 in training at all times to get 100 journeymen per year. Similarly, if you are a small company, to get 10 journeymen per year you need to be training 43 apprentices at all times.

U. S. Registered METALWORKING APPRENTICES*

Sheet Metal (mostly constr.)

1949	1950	1951	1952	1953
9,715	9,661	8,667	7,664	8,333

Machining Trades†

16,521	14,652	12,846	14,176	16,564

Others§

8,705	7,110	5,488	5,201	4,491

* Includes only apprentices registered with Bureau of Apprenticeship, New York not included

† Includes machinists, toolmakers, die sinkers, other machine shop

§ Includes jeweler and watchmaker, engraver, sheetmetal worker, molder and other foundry work, boilermaker, structural ironworker, other metalworking

Source: Bureau of Apprenticeship

SALARY OPPORTUNITIES

White Vs. Blue Collar Jobs

OFFICE:

Cost Accountant	$ 93.88
General Accountant	106.74
General Clerk	87.35
Production Control Clerk	79.97
Purchase Follow-Up Clerk	84.75
Production Planning Clerk	90.18
Shipping Clerk	74.72
Shop Timekeeper	74.97
Stock Clerk	75.10
Stores Record Clerk	74.34

Average weekly earnings $84.20*

FACTORY:

Automatic Screw Machine Opr.	$ 90.80
Die Sinker	130.00
Layout Man	87.60
Machinist (All around)	92.36
Milling Machine Opr.	84.40
Patternmaker	116.00
Planer Opr.	86.80
Punch Press Set-Up Man	85.20
Tool, Die & Gage Maker	98.88
Welder (Arc or Gas)	82.80

Average weekly earnings $95.48*

* Based on 40-hour work week

Source: Associated Industries of Cleveland. Survey of Cleveland-area plants only

cost a company nothing, yet less than half returned the questionnaire.

Example — However, Cleveland has one of the nation's highest ratios of registered apprentices to population of any industrial area in the nation, Oscar R. Poole, Bureau of Apprenticeship area supervisor, says. Although over half of the more than 3500 apprentices in the area are in the building trades, the Cleveland foundry industry has one of the most active programs. Co-operating with the school system, the foundry industry purchased $25,000 worth of equipment for the day trade school where apprentices get related training as well as much practical work. To stimulate more thinking among youth about apprenticeships, the industry co-operates with the Associated Industries of Cleveland each year in sponsoring a contest among apprentices. Cash awards are made and winners are eligible for national competition.

More industry co-operation with the public schools is an important factor in building the nation's apprentice program, apprentice administrators emphasize. This co-operation should take the form of assisting schools to advise students and setting up courses of study which will relate to the work a student expects to follow in adult life. Industry can do much to promote apprenticeships by participating in "career days." Theodore Haas, director of training, Thompson Products Inc., appears before student bodies each year explaining his company's apprentice opportunties.

Combating a Trend—Where are the best opportunities—in white collar or blue collar jobs? The accompanying table gives the facts, but it's industry's duty to combat the growing impression that "white collars" offer the most opportunities. National Tool & Die Manufacturers Association has a movie its members show to civic groups and students; excellent results have been reported to date. Another recommendation is to conduct tours for teachers, parents and students in plants showing them skilled men at work and explaining the importance of the work, the self-satisfaction and dignity of the occupation.

Good apprentice programs pay for themselves. The consensus of apprentice training executives is that an apprentice begins to pay his own way starting in the third year. Most apprentice programs follow a general pattern — four years of training divided into different phases of practical work and related training. Your company should tailor its program to fit its needs. Barth Corp., Cleveland, has one apprentice instructor who handles the entire program—both practical work and related training—for ten apprentices. Some companies depend upon public schools for related training, others give their own, some call upon private institutions.

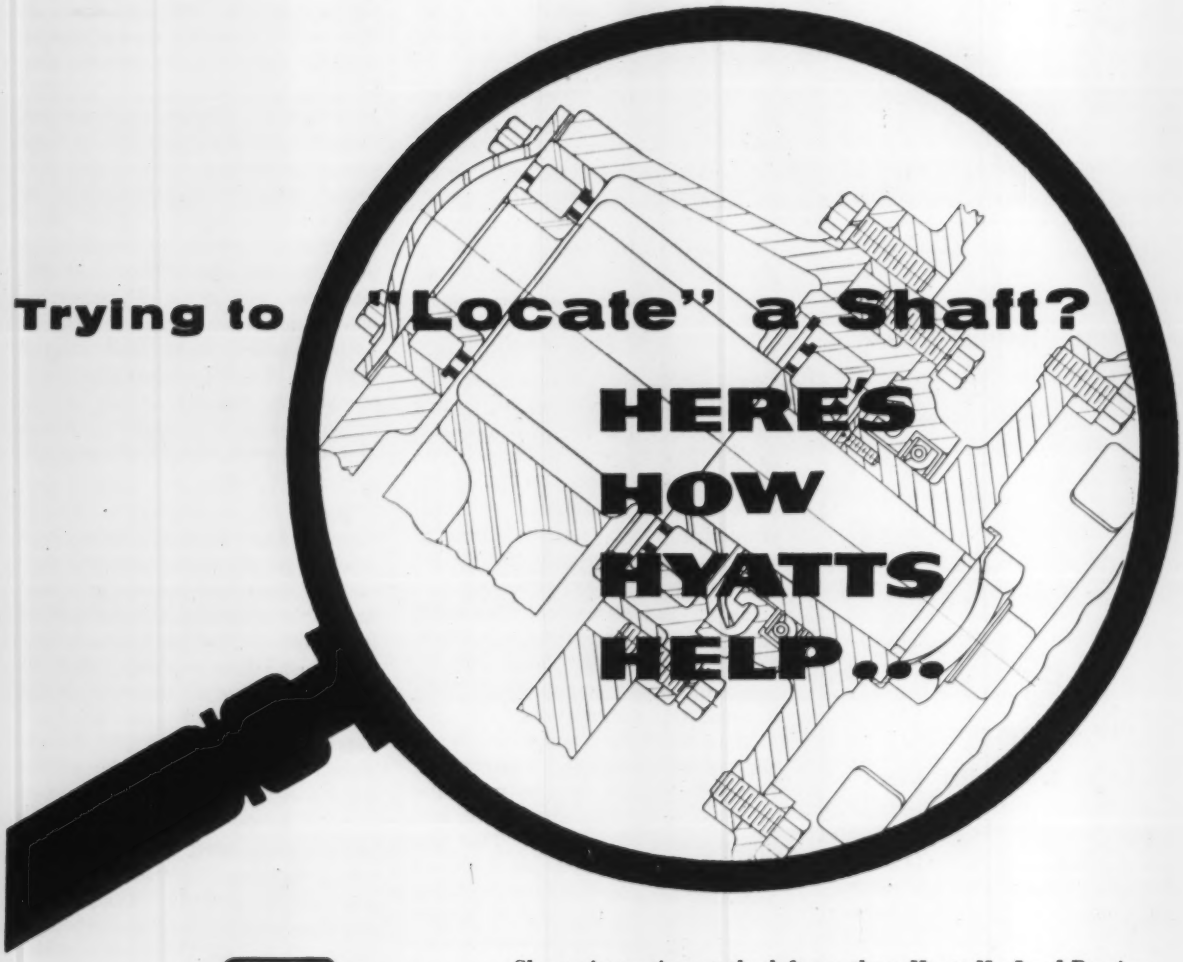
Simple Economics—The law of supply and demand should be enough to stimulate industry into action. Says one executive: "Companies have prided themselves on how much they've plowed back into their operations recently. But little of that plowing has been in the skilled labor field. If we don't start looking toward the future, what'll we have to pay for skilled labor ten years from now?"

Tally up the average age of your skilled men. Most officials are surprised to learn that the average is between 45 and 50. Couple this obvious need for replacements with the move toward automation which almost assuredly will mean that a greater ratio of skilled labor will be needed (STEEL, Apr. 12, p. 91), and the need for more apprentices becomes more striking than today's skilled labor stortage.

What Ratio?—At NTDMA's convention last October, members were told by the Subcommittee on Apprenticeship that a ratio of 1 apprentice to 5 journeymen is needed to maintain an adequate supply of tool and die makers. Many who have studied the apprentice situation claim that a 1:4 ratio is needed today.

Setting up an apprentice program is your company's insurance of an adequate skilled labor supply in the future. In addition, it'll pay these dividends: A better product from better workmanship, lower unit cost because of properly trained workers, greater employee stability because of greater worker loyalty. And you'll have a good source for future supervisors too.

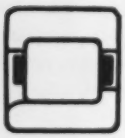
Trying to "Locate" a Shaft?



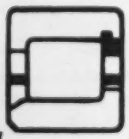
HERE'S HOW HYATTS HELP...

3 TYPES

BU-L separable outer race series



R-WB separable inner race series



R-YS separable inner race series

Shown in section at the left are three Hyatt Hy-Load Bearing types that are used for axial shaft location. Flanges on inner or outer races limit axial shaft movement and permit the bearing to take light, intermittent thrust loads.

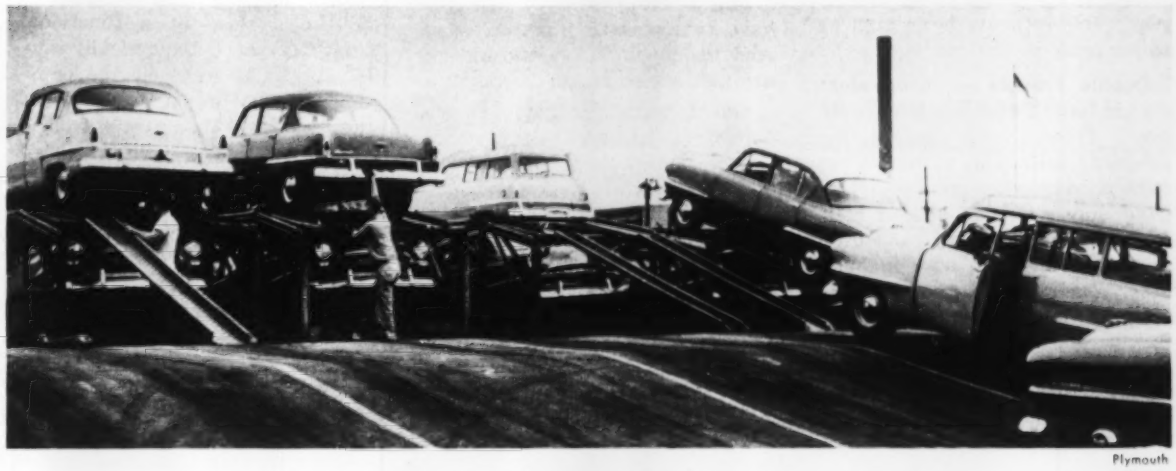
Since Hyatt inner races are assembled on shafts, with relatively heavy press fits, no accessory parts are necessary to hold them in place.

Hyatt Hy-Load Bearings are available with a variety of combinations of race flanges, snap rings, cages or separators, so that just the right combination can be selected for each set of operating conditions.

Hy-Loads are available in three diameter series, two widths and a complete range of sizes. For complete information write for Catalog 150—Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

STRAIGHT | BARREL | TAPER



Plymouth

Big Three's distribution edge over independents poses the question:

Packard-Studebaker Merger? Their Dealers Need More Volume

DETROIT

AS NASH and Hudson first open their doors this morning as American Motors Corp., the question inevitably arises: Will Studebaker and Packard be the next to merge?

It is not a new question. More than one motor city Hedda Hopper has cunningly deduced that since Studebaker and Packard are the last single automakers there might be interest behind outward indifference. But with sincere apologies to the Studebaker and Packard public relations men who will have to deny this statement, STEEL last week learned from a hitherto reliable source that there's talk in banking and finance circles about Studebaker and Packard joining by fall.

Embryonic—No actual negotiations between the two companies have begun. But it is understood that a basic exploration of the pros and cons of such a move is now under way and that as a result of that investigation a proposal will be drafted. Should the proposal seem worthwhile to both companies, negotiations will then begin, and the outcome will be some sort of joining of forces.

Reasons cited to STEEL by the spokesman as underlying merger investigation closely parallel those of George W. Mason in describing the Nash-Hudson benefits—increased financial strength, enlarged facilities and volume sales outlets. The first two items are those normally considered in merger prognostication, but the third points to a trend of increasing importance in the sales-minded auto industry.

The Reason—Today, perhaps more than ever before, the real end of the production line is the dealer. A backup in the dealer's hands ultimately means a backup on the assembly line and a shutdown. For cars, occupying a considerable space and subject to deterioration, cannot be put on shelves. They must move on into the consumer's garage to make room for more.

This situation has significance in the present production battles. Dealers have loudly shouted that they're being forced to take cars while factories have denied that anything of the sort happens. Actually, one dealer tells STEEL that in a sense the factory is right—the factory just tells the dealer how many cars it would be nice for him to sell that month. The dealer does not have to take the cars in much the same way that he does not have to stay in the auto business.

Slimmer Margins—In the prewar days, cars were specialty items which the purchaser usually bought for some reason other than price. Today cars are being turned out and sold like commodities rather than specialty items, and the new car dealer in major makes is getting his profit out of volume rather than high unit margin. Either the trade-in allowance is jacked up above market levels or the car price is pared to $100 or less over dealer cost. Some car dealers have been reported working on $25 per car, and you can make more than that retailing a new suit or washing machine.

The auto industry is moving ahead, therefore, on the premise that you must have volume distribution to sustain volume production. If the individual dealer sells enough cars and properly gears his operations to a volume selling job, it's possible that he will come out about the same in

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the end or even ahead. But plenty of dealers that can't handle volume are going to fold this year. One estimate is as high as 15 per cent.

Double Trouble — Independent dealers have a double sort of problem. They're still geared for speciality selling in what has become a commodity market. Handling only a few models of relatively low volume, they can't drop prices far and still stay in business. Their overhead is much the same as the turnover artist's and they've got to get more per unit to meet that, let alone make money.

That's where merger comes into the picture. Giving the dealer several makes of low volume may add up to the high volume of one hot line, figure the auto companies, just as adding Plymouth to the Dodge, Desoto and Chrysler dealerships was a smart move for Chrysler Corp. in the 1930s. Erosion of the dealer organization cuts down the distribution of the car if it continues long, in turn lowering production.

Needed: Volume—Jim Nance, perhaps more than any other auto executive, is acutely aware of the need for volume distribution to sustain volume production. Packard's manufacturing operations will be geared to its own line of cars, but the need for another line of cars to handle the dealer's volume needs is another matter.

It is this matter that lends credence to the report of the Sutdebaker-Packard merger explorations.

You may not soon walk into your Hudson-Kaiser-Nash-Packard-Studebaker-Willys dealer's, but the move is definitely in that direction.

Car of the Week

The Chevrolet Corvette is a car that cannot fail to make a good first impression. From its relatively uncluttered styling to its beautifully appointed interior, the Corvette is a pleasing car in appearance. The seating position is comfortable and from the well-instrumented dash to the signal-seeking radio the car is a magnificent combination of beauty and functionalism.

But to really know a car, you have to live with it a few days. And under that Corvette makeup are a few blemishes.

On a warm, bright day the Corvette sparkles. Acceleration is exciting and its handling and cornering characteristics are outstanding. The car does things easily and well. But it's a good thing the car is so easy to drive, for on a rainy day you have to drive and bail at the same time.

Never have we contacted a car that leaked more water in more places than a Corvette. At the end of a one-hour thunder shower the Corvette literally had over half an inch of water standing over the floor, and the top was up and the windows in place. And even after the rain was over, splash from the pavement quickly rewetted the floor as quickly as it could be bailed. Perhaps because it's an infant design, the Corvette gets its bottom wet badly.

As with many sports cars, putting the top up on a Corvette is not a one-man job, and with the top up the inside rear-view mirror stops just above car level giving an excellent view of nothing in particular. Another drawback of the Corvette continues to be the absence of a functional front bumper. Aesthetically satisfying as all get out, the omission recently assisted in one of the most appalling bashes from a minor front end collision you'd ever want to see. The slowing Corvette bumped into the rear of another car stopped for a traffic light and the result looked like a plane crash.

Virtually lacking engine-braking due to the Powerglide transmission, you could only go deep into about two turns before your Corvette's brakes faded to nothing in a race.

Steering, while quick, could stand to be even more so for correction in cornering at speed. But be that as it may, the Corvette is more fun to drive than anything to come down the American pike in many a moon. And for a sports car, who can say that isn't enough?

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,801	628,017
March	672,485	752,149
April		782,453
May		685,390
June		713,206
July		757,595
August		641,152
September		605,228
October		651,153
November		457,852
December		529,588
Total		7,817,783

Week Ended	1954	1953
Mar. 27	149,562	181,749
Apr. 3	146,498	170,567
Apr. 10	152,074	176,783
Apr. 17	148,559	162,171
Apr. 24	156,754	194,610
May 1	158,000*	184,800

Source: Ward's Automotive Reports.
*Estimated by STEEL.

Exhaust Notes

On the subject of sports cars, it is rumored this week that Plymouth is planning production of its Belmont. More desirable in the opinion of most, would be the Dodge Firearrow or one of the Ghia jobs.

An informant at Ford Motor Co. reports that the firm is planning introduction of its 1955 models in October of this year. That statement checks with other reports. He then goes on to say that the 1956 models will be introduced in June, 1955. This statement, if true, could portend some startling changes in new car merchandising. And when you stop to think about it for a moment, a June introduction could have some definite advantages.

Ford Motor Company's engineering staff has developed the use of a new material for making die models and patterns which will speed the production of new cars. The process involves the substitution of laminated and impregnated mahogany board for the plain mahogany board normally used to make the wooden models from which steel production dies are formed.

Its Tra[illegible]n Tells the Story!

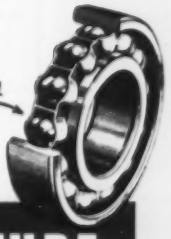
14 BALL BEARINGS IN EIMCO'S NEW UNIDRIVE— ALL NEW DEPARTURES!

Fourteen New Departures in Eimco's Unidrive transmission keep shafts and gears always in accurate alignment . . . assure peak performance with virtually no maintenance.

Rough terrain and tight spots are no problems to Eimco's agile 105 Tractor-Loader with its new Unidrive transmission. And contributing to the Unidrive's advantages are 14 New Departure precision **ball** bearings. These New Departures mean positive, accurate positioning of the closely related moving parts. They carry radial, thrust and combination loads. They permit compact, rugged design . . . assure long life with no need for adjustment.

Whatever the bearing problem, New Departure can help you. When improving a product or designing a new one . . . *talk to your New Departure engineer.*

NOTHING ROLLS LIKE A BALL

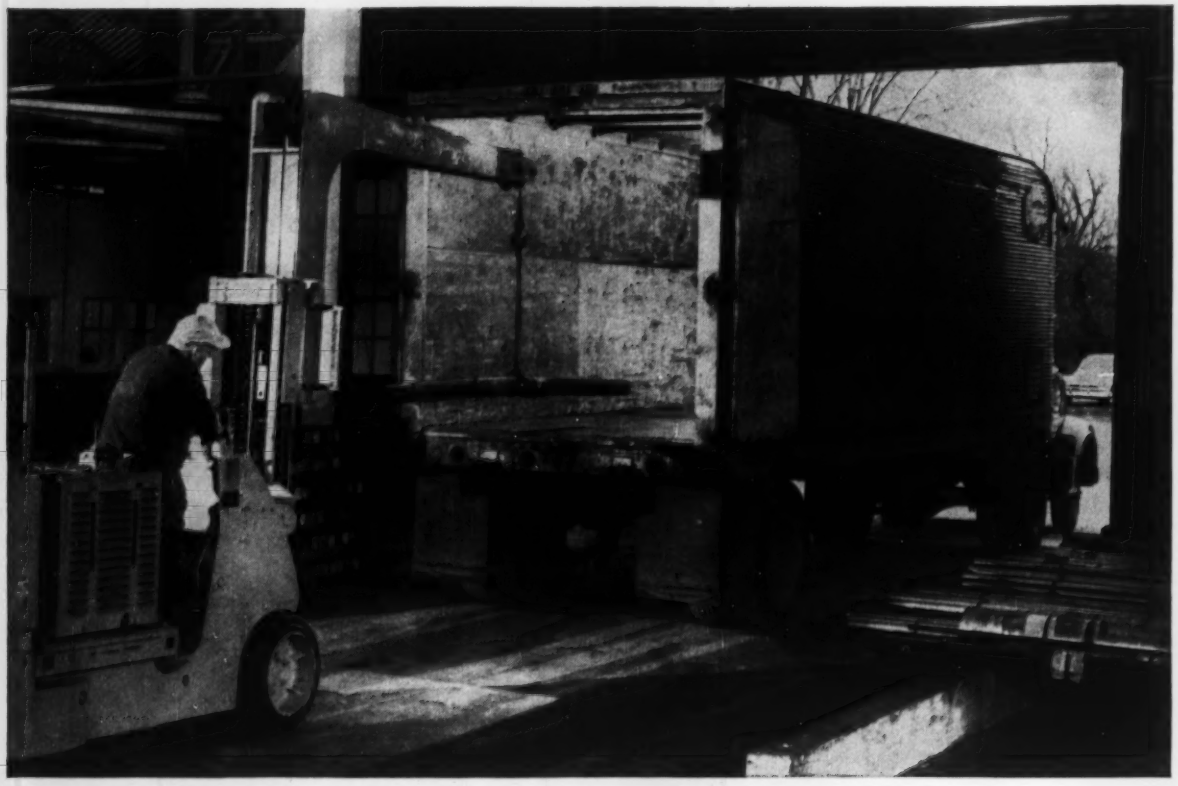


NEW DEPARTURE
BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT
Plants also in Meriden, Connecticut, and Sandusky, Ohio
In Canada, McKinnon Industries, Ltd., St. Catharines, Ontario

NEW DEPARTURE SALES ENGINEERING OFFICES—AT YOUR SERVICE

BRISTOL	269 North Main St.	2-6371	**DETROIT**	7-122 General Motors Bldg.	Trinity 2-4700	**KANSAS CITY**	1021 E. Linwood Blvd.	Valentine 4939
BOSTON	517-A Park Square Bldg.	Hancock 6-9867	**CINCINNATI**	2107 Carew Tower	Main 5783	**MILWAUKEE**	647 W. Virginia St.	Broadway 6-9460
KANNAPOLIS, N. C.	P. O. Box 1086	2-3181	**CLEVELAND**	3113 W. 110th St.	Winston 1-5454	**ST. LOUIS**	3001 Washington Blvd.	Franklin 6533
NEW YORK	1775 Broadway	Circle 6-1540	**INDIANAPOLIS**	1357 W. 18th St.	Imperial 4680	**LOS ANGELES**	5035 Gifford Ave.	Logan 8-2301
PHILADELPHIA	850 E. Luzerne St.	Garfield 3-4136	**PITTSBURGH**	Cathedral Mansions	Mayflower 1-8100	**BERKELEY**	1716 Fourth St.	Landscape 6-8750
SYRACUSE	2360 James St.	73-5195	**CHICAGO**	332 So. Mich. Ave.	Wabash 2-5875	**SEATTLE**	5000 First Ave., S.	Lander 5920
			DAVENPORT	2212 E. 12th St.	Davenport 7-7522			



Order your size of TIMKEN® 52100 steel tubing today—we'll ship from mill stock tomorrow!

101 sizes of Timken® 52100 steel tubing are available in mill stock to take care of your rush hollow parts jobs. Order your size in less-than-mill quantities today, and we'll ship within 24 hours.

Timken 52100 steel tubing is excellent for most of your high quality hollow parts jobs. It's a through-hardening steel in moderate sections. It can be heat treated to file hardness and tempered back to any desired point. And it can be used in place of more expensive steels.

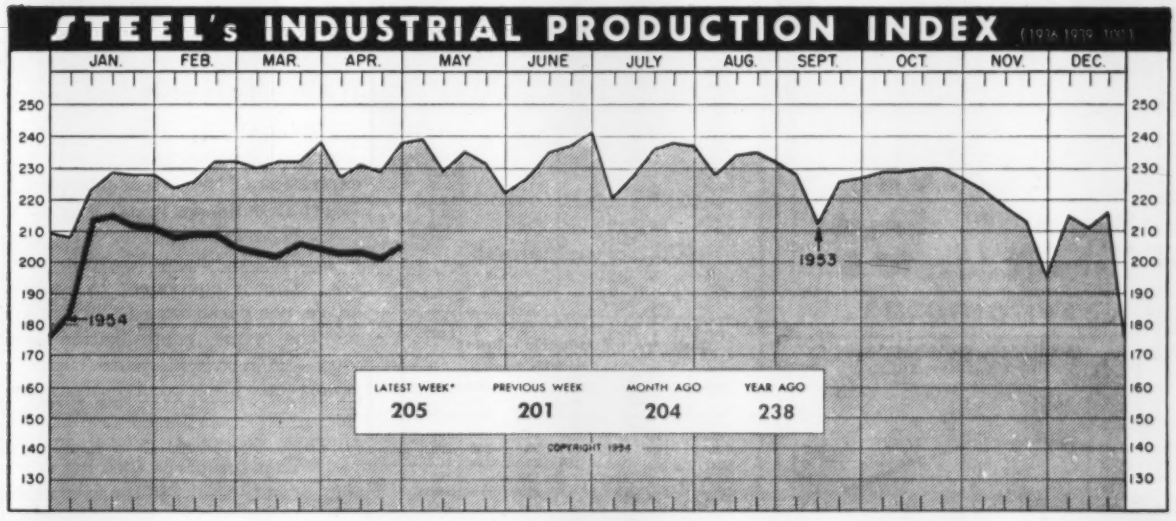
Available in sizes from 1″ to 10½″ O.D., Timken 52100 steel is used for hollow parts jobs like these: aircraft parts, ball bearing races, pump parts and plungers, collets, bushings, spindles, grinding machine parts, precision instruments, and dozens of other jobs.

The Timken Company is America's pioneer producer of 52100 tubing. And we're the only company that makes 52100 steel in tubing, bars and wire. Our unequaled experience assures you of uniform quality from tube to tube and heat to heat.

For immediate delivery of your less-than-mill quantity orders, write, wire or phone The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING


STEEL's INDUSTRIAL PRODUCTION INDEX (1936-1939=100)
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
250 240 230 220 210 200 190 180 170 160 150 140 130
1954
1953
LATEST WEEK* 205
PREVIOUS WEEK 201
MONTH AGO 204
YEAR AGO 238
COPYRIGHT 1954

*Week ended Apr. 24

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.

Purchasers See Second Month of Improvement

INDUSTRIAL BOOKINGS and production are up! The Business Survey Committee of the National Association of Purchasing Agents reports that these barometers are higher for the second consecutive month and that the pace is accelerating. A better order position is revealed by 43 per cent of the buyers surveyed, compared with 17 per cent still on the slide. Heftier production is listed by 33 per cent, while 18 per cent continue down. Although the individual changes are not large, the Survey Committee believes that business is firming up and will show a gradual improvement in the second quarter. The survey also notes a greater strength in prices, particularly in nonferrous metals, stimulated by the announcement of government stockpiling plans.

STEEL's Index Jumps . . .

During the latest week, STEEL's industrial production index rose to the highest level in over a month. Responding to stepped-up automobile outturn and a gain in steel output, STEEL's index jumped 4 percentage points above the preceding week to a preliminary 205 per cent of the 1936-1939 average. At the present level, industrial production is 33 points below the comparable week last year.

Auto Output Climbs . . .

Rising to their highest weekly output this year, U. S. car and truck manufacturers turned out an estimated 146,092 units in the week ended Apr. 24. Increased schedules at General Motors and Ford accounted for the upturn, *Ward's Automotive Reports* relates. A 50-year production high of 13,319 units was attained by Buick.

GM Sets Record . . .

The recent upward revision in production by General Motors follows the best first-quarter passenger car business in its history. Harlow H. Curtice, president, says that GM's domestic outturn of 706,000 passenger cars in the first quarter established a new record, 2 per cent higher than the previous one set in 1953.

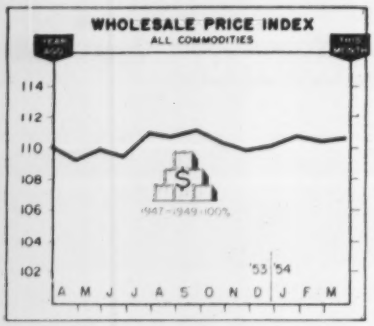
Sales of all GM commercial and defense products in the first three months totaled $2410 million, only $137 million less than in the comparable months last year. The slump in defense business primarily accounted for this decline. While first-quarter defense volume was off 13 per cent, commercial business was down only 2 per cent from last year's levels.

A New Record? . . .

With retail deliveries by automobile dealers in the first quarter approximating 95 per cent of the same period last year and with current deliveries running ahead of the comparable period, Mr. Curtice estimates that GM's total second-quarter business will be 10 to 15 per cent better than in the first quarter.

Pacesetters . . .

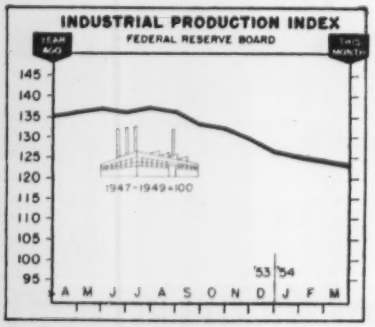
Sales of some manufacturers were up in the first quarter, counter to the general trend. General Electric Co. says that sales of its small appliance division ran 15 per cent above those in the same quarter in 1953. Shipments from Westinghouse Electric Corp.'s appliance division in the first three months rose 5 per cent above the comparable period of last year, and John



Wholesale Price Index
(1947-1949=100)

	1954	1953	1952
Jan.	110.9	109.9	113.0
Feb.	110.5	109.6	112.6
Mar.	110.6	110.0	112.3
Apr.	....	109.4	111.8
May	....	109.8	111.6
June	....	109.5	111.3
July	....	110.9	111.8
Aug.	....	110.6	112.2
Sept.	....	111.0	111.7
Oct.	....	110.2	111.1
Nov.	....	109.8	110.7
Dec.	....	110.1	109.6

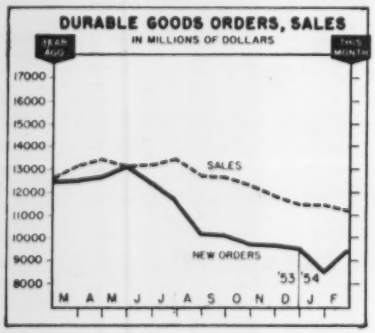
U. S. Bureau of Labor Statistics.



Industrial Production Index
1947-1949=100

	Total Production		Primary Metals		Metal Fabricating	
	1954	1953	1954	1953	1954	1953
Jan.	125	134	111	135	155	168
Feb.	124	134	108	137	152	168
Mar.	123	135	101	136	148	168
Apr.	...	136	...	136	...	169
May	...	137	...	139	...	169
June	...	136	...	137	...	168
July	...	137	...	136	...	171
Aug.	...	136	...	137	...	171
Sept.	...	133	...	130	...	166
Oct.	...	132	...	128	...	165
Nov.	...	129	...	122	...	159
Dec.	...	126	...	113	...	156
Avg.	...	134	...	132	...	167

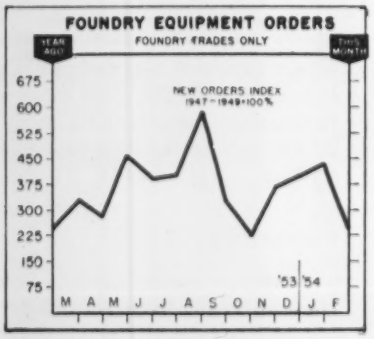
Federal Reserve Board



Durable Goods Orders, Sales
In Millions of Dollars*

	New Orders		Sales	
	1954	1953	1954	1953
Jan.	8,475	12,454	11,580	12,508
Feb.	9,531	12,416	11,366	12,666
Mar.	....	12,520	.....	13,116
Apr.	....	12,702	.....	13,398
May	....	13,101	.....	13,148
June	....	12,392	.....	13,166
July	....	11,600	.....	13,410
Aug.	....	10,139	.....	12,730
Sept.	....	10,110	.....	12,698
Oct.	....	9,677	.....	12,376
Nov.	....	9,631	.....	11,867
Dec.	....	9,567	.....	11,576

*Seasonally adjusted. U. S. Bureau of Business Economics.



Foundry Equipment Orders

	Index (1947-1949=100)		Value Thousands	
	1954	1953	1954	1953
Jan.	173.8	99.6	$2,463	$1,418
Feb.	99.9	97.5	1,423	1,388
Mar.	....	132.2	....	1,882
Apr.	....	111.8	....	1,592
May	....	182.1	....	2,594
June	....	156.4	....	2,227
July	....	158.9	....	2,263
Aug.	....	235.5	....	3,353
Sept.	....	127.7	....	1,818
Oct.	....	87.1	....	1,241
Nov.	....	149.4	....	2,128
Dec.	....	160.8	....	2,290

Foundry Equipment Mfrs. Assn.

Charts Copyright 1954 STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction ..... Apr. 26	Ironers ..... Apr. 12	Refrigerators ..... Apr. 19
Employ., Metalwk.. Apr. 5	Machine Tools .... Mar. 8	Steel Castings .... Mar. 15
Employ., Steel .... Apr. 26	Malleable Castings. Mar. 15	Steel Forgings .... Mar. 8
Fab. Struc. Steel.. Apr. 19	Prices, Consumer.. Mar. 22	Steel Shipments .... Apr. 12
Freight Cars ..... Apr. 26	Pumps ..... Mar. 15	Vacuum Cleaners.. Apr. 5
Furnaces, Indus. .. Apr. 19	Radio, TV ..... Apr. 26	Wages, Metalwk. .. Mar. 1
Gears ..... Apr. 12	Ranges, Elec. .... Apr. 19	Washers ..... Apr. 12
Gray Iron Castings. Mar. 15	Ranges, Gas ..... Mar. 22	Water Heaters .... Mar. 22

A. Ashbaugh, vice president of the division, says that a sharper increase is indicated for the present quarter.

Profits—the Final Test . . .

Earnings also rose for many corporations—partially due to the expiration of the excess profits tax. International Business Machines Corp. reports net income after taxes of $10,134,429 for the first quarter. This is equivalent to $3.09 a share, compared with $2.29 a share on the same capitalization last year. Monarch Machine Tool Co. reports net profit for the first quarter totaled $540,213 after all charges including federal income tax. That compares with net earnings of only $377,788 for first quarter, 1953. Jerome A. Raterman, president, states that orders continue to come in at a rate that assures his company of a profitable operation.

Better Business Sighted . . .

Many other corporations anticipate that sales and earnings will increase during the second quarter. On the basis of current shipping orders, Borg-Warner Corp. has good reason to expect a material rise in sales and a gratifying climb in earnings, compared to the second quarter of last year. R. C. Ingersoll, president, points out that automotive production is certain to continue on a very satisfactory level and that current sales of farm equipment components and home appliances have shown a considerable increase.

Sales of Consolidated Mining & Smelting Co. of Canada Ltd. were higher in the first quarter than in the comparable period a year ago. R. E. Stavert, president, also says that the recent reduction in zinc output by producers has improved the statistical position of this metal.

During March, makers of copper products recorded a substantial pickup in activity. Bookings for new orders were the best since June, 1953, and shipments were the highest since last October. New orders called for the use of 104,734 tons of refined copper, the largest tonnage ordered since June,

BAROMETERS OF BUSINESS

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,634	1,622	2,276
Electric Power Distributed (million kwhr)	8,257	8,345	8,016
Bitum. Coal Output (daily av.—1000 tons)	1,115	1,110	1,450
Petroleum Production (daily av.—1000 bbls)	6,575[1]	6,589	6,278
Construction Volume (ENR—millions)	$248.0	$306.6	$275.0
Automobile, Truck Output (Ward's—units)	156,754	148,559	194,610
TRADE			
Freight Car Loadings (unit—1000 cars)	616[1]	613	780
Business Failures (Dun & Bradstreet, no.)	229	198	159
Currency in Circulation (millions)[3]	$29,673	$29,793	$29,722
Dept. Store Sales (changes from year ago)[3]	+12%	+16%	+8%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$17,987	$17,299	$18,391
Federal Gross Debt (billions)	$269.9	$269.9	$264.3
Bond Volume, NYSE (millions)	$17.4	$14.9	$20.4
Stocks Sales, NYSE (thousands of shares)	9,896	8,345	7,863
Loans and Investments (billions)[4]	$78.7	$79.1	$76.9
U. S. Gov't Obligations Held (billions)[4]	$31.3	$31.5	$29.6
PRICES			
STEEL's Finished Steel Price Index[5]	189.74	189.74	181.31
STEEL's Nonferrous Metal Price Index[6]	213.9	214.2	222.7
All Commodities[7]	111.3	111.0	109.4
Commodities Other Than Farm & Foods[7]	114.6	114.5	113.2

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1954, 2,384,549. 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

1953, while shipments used up 103,846 tons of the metal.

A Clear Example . . .

One of the clearest examples of what the end of excess profits tax has done to net earnings is seen in the first-quarter report from General Electric Co. Sales volume was $715.6 million, off the record set last year by 8 per cent. Yet earnings of $48 million were ahead of last year's first quarter by 42 per cent. Ralph J. Cordiner, president of GE, says the substantial increase was made possible by elimination this year of the unpopular tax.

Construction Continues Pace . . .

Construction continues to give reason for optimism. Dun & Bradstreet reports that building permits issued in 215 cities during March amounted to about $517.4-million, which was the highest ever recorded for March and the largest monthly total since August, 1950. Permits for the first quarter in those cities were 7.4 per cent above year-ago figures and only 1.1 per cent below the all-time high set in 1951. The cumulative total for the three months is almost $1.2 billion.

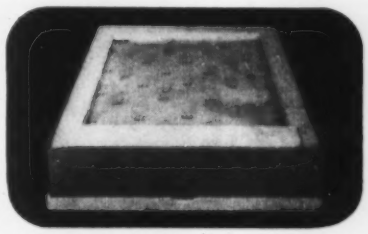
Further substantiating the reports of high construction rates are the continuing heavy shipments of fabricated structural steel as reported by American Institute of Steel Construction. March, with estimated shipments of 285,365 tons, surpassed the corresponding month last year for the third straight month. That is also an increase of about 32,000 tons over February, which itself was considered a good month.

Easy Money Policy To Stay . . .

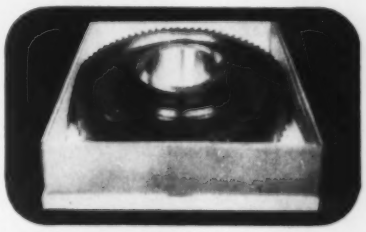
Winfield W. Riefler, assistant to the chairman of the Federal Reserve Board of Governors, speaking before a businessmen's conference in Chicago, said the Board's easy-money policy has not reversed the business downturn as it was intended to do. But in areas of the economy which have shown firmness, he said, the policy has been an important factor. Nevertheless, A. L. Mills, chairman of the board, told the U. S. Chamber of Commerce in Washington last week that the policy should continue "today and into the foreseeable future."

HOW MARVELLUM vpi® WRAP Speeds Assembly of Diesel-Electric Locomotives

Part arrives at assembly plant in steel-strapped skidded carton ready for stand-by storage.



Removal of carton top reveals rust-preventive VPI cover sheet held in place by top blocking.



Gear, on bottom sheet of VPI paper, is clean, bright and ready for immediate installation. No messy, time-consuming degreasing delays the assembly of General Electric diesel-electric locomotives.

In shipment and storage, Marvellum VPI Wrap positively protects parts against rust. A special coating on the paper vaporizes and forms an invisible protective film around the item packed, preventing corrosion. Wherever prevention of rust is a factor, you can save time and money with VPI. To get all the facts about this revolutionary protective wrap, write for our fully descriptive booklet and generous VPI sample. Our technicians will be glad to discuss corrosion problems peculiar to your plant.

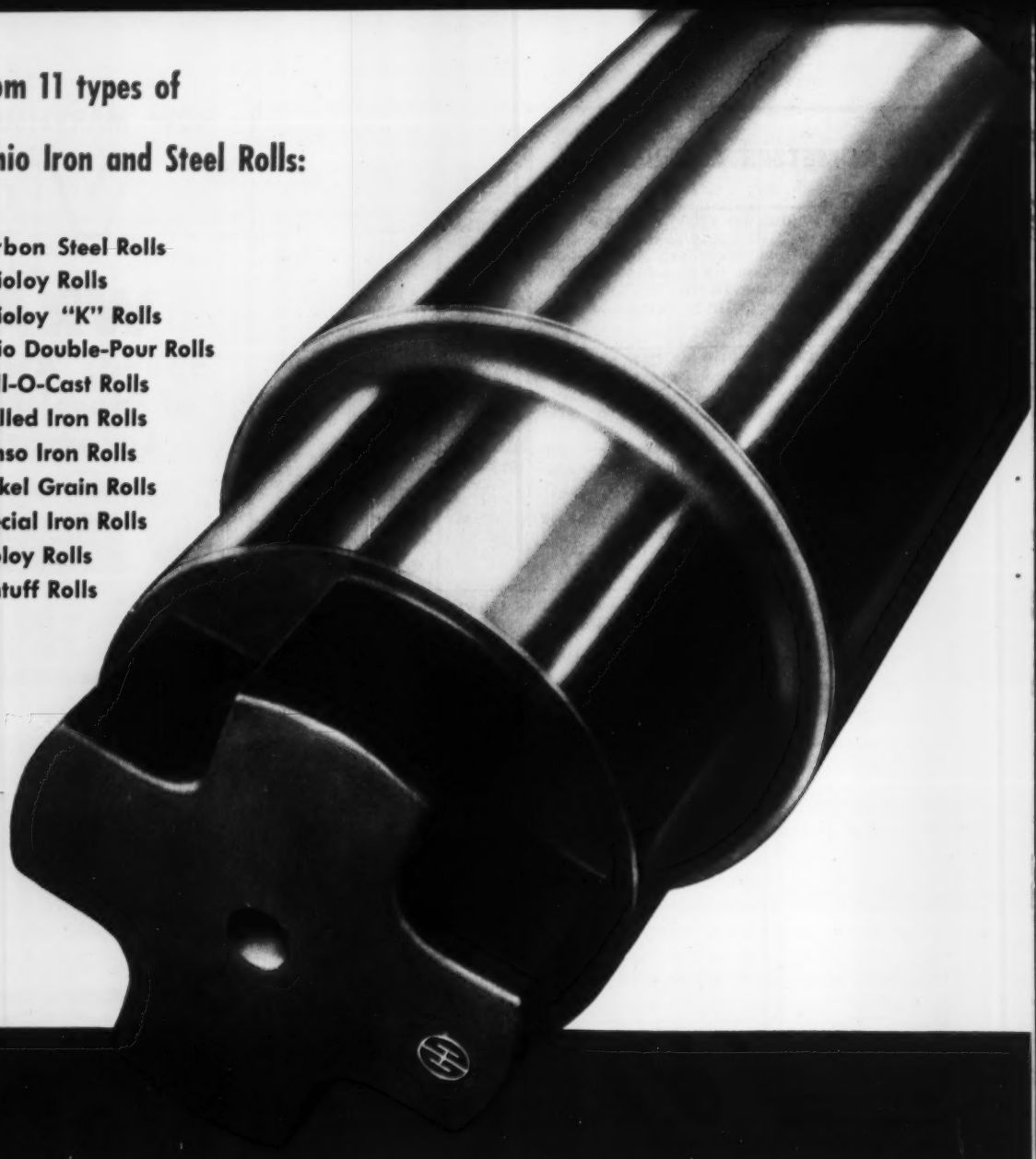
The MARVELLUM COMPANY

1 Appleton St., Holyoke, Mass.

Choose from 11 types of

Ohio Iron and Steel Rolls:

- Carbon Steel Rolls
- Ohioloy Rolls
- Ohioloy "K" Rolls
- Ohio Double-Pour Rolls
- Holl-O-Cast Rolls
- Chilled Iron Rolls
- Denso Iron Rolls
- Nickel Grain Rolls
- Special Iron Rolls
- Nioloy Rolls
- Flintuff Rolls



Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY

THE OHIO STEEL FOUNDRY CO.

MELVIN W. PAULY
. . . Lunkenheimer gen. mgr.-sales

FREDERICK W. McINTYRE Jr.
. . . Reed-Prentice president

DON WATKINS
. . . joins Continental Foundry & Machine

Melvin W. Pauly was made general sales manager and **H. H. Layritz** assistant general sales manager of **Lunkenheimer Co.**, Cincinnati. Mr. Pauly joined the company in 1950 as New York manager and later became sales manager, eastern division.

George Doig was appointed sales manager of **Numatics Operating Valves**, Milford, Mich. He recently resigned from J. N. Fauver Co., Detroit, where he had been local sales engineer for six years.

Phoenix Mfg. Co. appointed **Lawrence D. Toolan** sales manager of its forging division located at Catasauqua, Pa. He recently served as district manager for American District Steam Co.

W. T. Sauer was made assistant export manager of **Champion Spark Plug Co.**, Toledo, O., to succeed the late **E. C. Badger Jr.**

Consolidated Vultee Aircraft Corp., San Diego, Calif., appointed **R. R. Hoover** chief project engineer and **W. S. Ivans** chief electronic engineer.

Walter E. Schroeder is now chief engineer of **Colonial Iron Works Co.**, Cleveland. He formerly was district chief in charge of Canadian activities of Stone & Webster Engineering Corp. at Toronto, Ont., and Boston.

Frederick W. McIntyre Jr., vice president, was elected president of **Reed-Prentice Corp.**, Worcester, Mass. He succeeds **Frederick W. McIntyre Sr.**, now chairman of the board. **Donald H. Dalbeck**, controller-treasurer, was elected a director and vice president. Also elected a vice president is **Iver G. Freeman** who has been with Norton Co. for 38 years.

Metal & Thermit Corp., New York, appointed **Frank J. O'Brien Jr.** general sales manager. He joined the firm in 1951 as manager of its scrap division and has been a vice president since 1952. **John B. Tinnen**, formerly vice president-general sales manager, continues as chief executive sales officer of the company with extended activities including general administration and planning and programming for company expansion. **H. W. Buchanan Jr.** was appointed sales manager, chemical division.

Paul S. Landis was appointed an assistant manager, sheet and strip products, for **Jones & Laughlin Steel Corp.**, Pittsburgh. He formerly was manager, plate sales, for Colorado Fuel & Iron, Claymont, Del., formerly Worth Steel Co.

Frank R. Osborne was made general manager of **Mission Appliance Corp.**, Hawthorne, Calif.

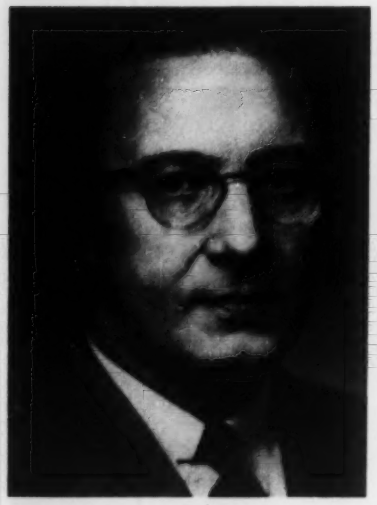
Don Watkins joined **Continental Foundry & Machine Co.**, East Chicago, Ind., as a vice president. He will have headquarters in company offices at Pittsburgh. Associated with the steel industry for over 30 years, Mr. Watkins has served in an executive capacity with a number of companies in the industry and in allied fields.

American Emery Wheel Works, Providence, R. I., elected **Frederick J. Darby** president and works manager, **Harold O. Skoog** vice president and ceramic engineer, **Torrey Allen** treasurer and general manager and **W. W. Turner** secretary and sales manager. **Arthur L. Pierce**, secretary-treasurer and general manager, retired after 46 years with the company.

Harry E. Lewis was made general manager of the insulation division of **M. H. Detrick Co.**, Chicago. He formerly was executive director of the Industrial Mineral Fiber Institute Inc.

Richard M. Morgan, formerly a design engineer for Harris-Seybold-Potter Co. and a tooling engineer with General Motors Corp., joined **Miller Fluid Power Co.**, Melrose Park, Ill. He will be in charge of production tooling, production engineering and plant layout.

Ingalls Iron Works Co., Birmingham, appointed **Richard G. Haas**



WILLIAM V. O'BRIEN

GEORGE E. BURENS

HAROLD E. STRANG

. . . three newly elected vice presidents of General Electric Co.

resident manager of its Verona, Pa., fabricating plant.

Newly elected vice presidents of **General Electric Co.** are **William V. O'Brien, George E. Burens** and **Harold E. Strang.** General managers of their respective divisions, Mr. O'Brien at New York heads the apparatus sales, Mr. Burens at Philadelphia the switchgear and control and Mr. Strang at Lynn, Mass., the measurements and industrial products.

Barber-Colman Co., Rockford, Ill., appointed **Howard A. Nelson** administrative assistant to the sales manager in its machine and small tool divisions. **Nels O. Thornbloom** was made chief engineer-machine tool sales, and **S. J. Johnson** chief engineer, small tool division.

Walton H. Hofmann, assistant chief engineer of Bethlehem Steel Co.'s Johnstown, Pa., steel plant, was transferred to San Francisco as chief engineer of construction for **Bethlehem Pacific Coast Steel Corp.'s** steel division.

Paul W. Hook, treasurer of **Wellman Bronze & Aluminum Co.,** Cleveland, was added to the board of directors.

Edward C. Clark was placed in charge of **General Electric Co.'s** activity in the gas industry. He will co-ordinate activities in the use of gas turbines in various industries with particular emphasis on natural gas pipeline pumping.

Link-Belt Co. appointed **Rodney F. Coltart** and **Benjamin M. Prestholt** sales managers on the West Coast. Formerly sales engineers, Mr. Coltart has headquarters at the San Francisco plant and Mr. Prestholt at the Los Angeles plant.

Edward H. Wheeler, chief engineer, **Standard Pressed Steel Co.,** Jenkintown, Pa., was made manager of the forging division in charge of hot and cold headers, production thread rollers and the facing and drill, broach and knurl sections. **John M. Sherman** is now chief engineer. He formerly was manager of quality control.

Frank W. Davis was named chief engineer of the Ft. Worth, Tex., division of **Consolidated Vultee Aircraft Corp.** to replace **J. W. Larson,** resigned.

Shieldalloy Corp., division of Metallurg Inc., New York, elected **Edward H. Stann** treasurer and **S. W. Madsen** assistant vice president.

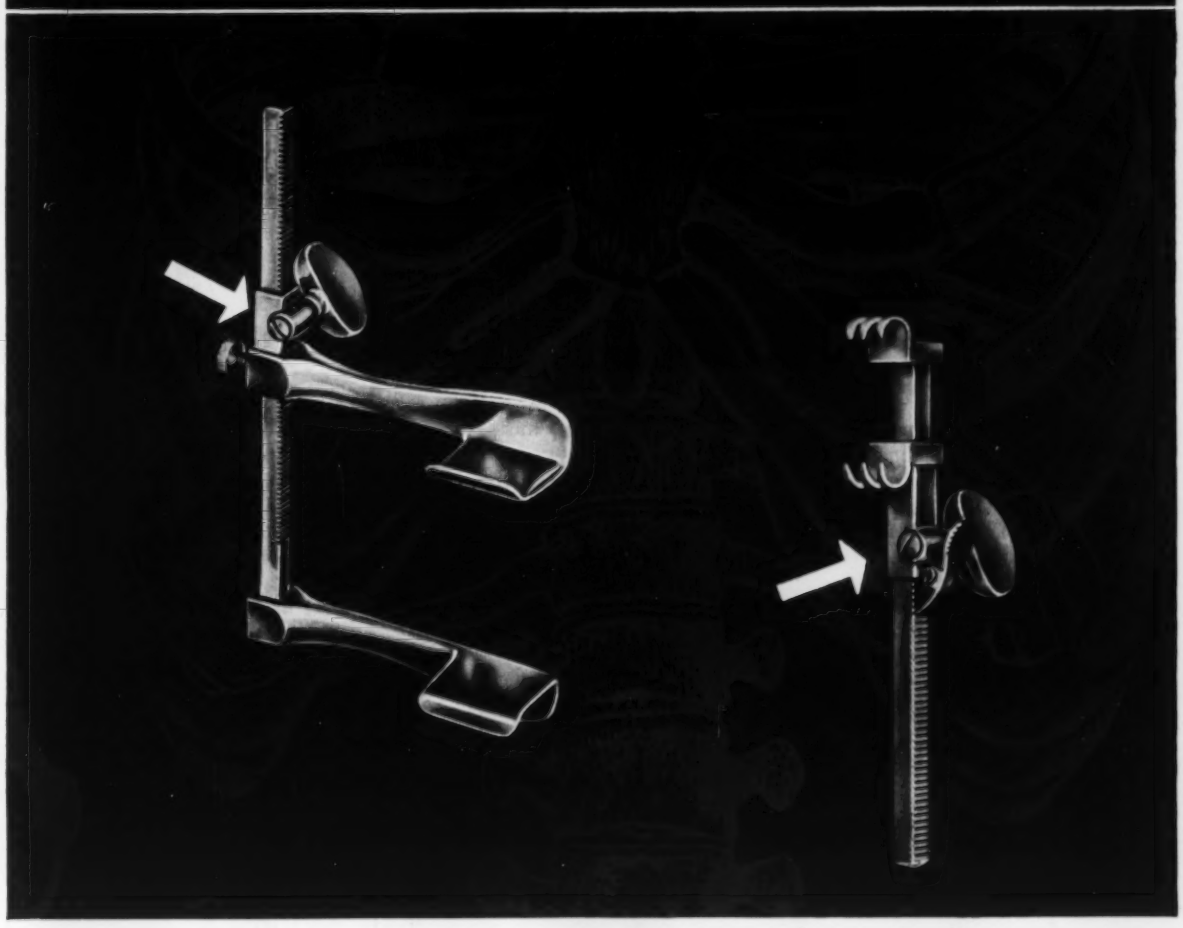
California Steel Products Co., Richmond, Calif., recently acquired by American District Steam Co. Inc., appointed **Harold W. Dornsife**

EDWARD H. WHEELER

JOHN M. SHERMAN

. . . SPS forging div. manager and chief engineer

How to simplify a moving problem



It's a safe bet you've never met these two devices before. On the left is a Tuffier Rib Retractor; on the right, a Bailey Rib Contractor. Both are made by George P. Pilling & Son Co., famed surgical instrument makers of Philadelphia.

The retractor is used by the surgeon to move ribs apart; the contractor to move ribs back to normal position after an operation.

Among the many problems that cropped up in the construction of these instruments was the design of the pinion rod supports (arrows) that slide on the square racks. One solution was to broach a square hole in bar stock, but the cost was high.

Pilling discovered Superior could draw square tubing from type 304 stainless steel to the close I.D. tolerance they required. Superior stainless steel tubing resists corrosion, has no plating to wear off, silver-solders without difficulty.

Superior square tubing is only one of a wide variety of round and shaped tubing made by Superior in up to 55 analyses. And every length or coil of Superior tubing is backed by Superior tubemanship—production and research that make a real difference when you're in a jam. Superior Tube Company, 2005 Germantown Ave., Norristown, Pa.

Round and Shaped Tubing Available in Carbon, Alloy, and Stainless Steels; Nickel and Nickel Alloys; Beryllium Copper; Titanium; Zirconium.

Superior

THE BIG NAME IN SMALL TUBING

All analyses .010" to ⅝" O.D.
Certain analyses in Light Walls up to 2½"

West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif., RAymond 3-1331

OLIVER FULLER
. . . heads new Harnischfeger div.

WALDEMAR NAUJOKS
. . . joins Globe Forge Inc.

WILLIAM D. HAHN
. . . heads City Auto Stamping Co.

vice president and general manager. He was project manager at C. F. Braun & Co.

In expansion of activities in its line of electrical products **Harnischfeger Corp.** has placed **Oliver Fuller** in charge of a new division at Milwaukee established to handle sales of P&H electrical equipment. Mr. Fuller formerly was with P&H welder and excavator manufacturing at Escanaba, Mich. He joined Harnischfeger early in 1946.

W. P. Drake was named president of the new Industrial Chemicals Division of **Pennsylvania Salt Mfg. Co.**, Philadelphia.

James G. Wiley, formerly with the Dayton, O., district office of Detroit Steel Corp., joined **Federal Steel Corp.**, Dayton.

Waldemar Naujoks was elected vice president and general manager, **Globe Forge Inc.**, Syracuse, N. Y. He joins Globe after five years as special projects engineer at Ladish Co., Cudahy, Wis. The preceding 20 years he spent with Steel Improvement & Forge Co., Cleveland, 12 of them as chief engineer.

E. S. Russey, president and general manager of **Borg-Warner Corp.'s** Warner Gear Division, Chicago, was elected a director of B-W to succeed **J. Lester Dryden**, retired.

Warren C. Dunn was made supervisor of product sales in the general apparatus sales department of **Union Switch & Signal Division**, Westinghouse Air Brake Co., at Swissdale, Pa.

William D. Hahn, former treasurer, **City Auto Stamping Co.**, Toledo, O., was elected president of the company and of its subsidiary, City Machine & Tool Co. He succeeds the late **Charles H. Bigelow.**

Robert M. Simpson was named assistant manager of **Crucible Steel Co. of America's** San Francisco sales branch.

Henry C. Buckingham, president, **Thor Corp.**, Chicago, will also act as chairman of the board. He succeeds **Raymond J. Hurley** as chief executive officer. Mr. Hurley resigned as chairman and as a director of the company.

Penn Controls Inc., Goshen, Ind., elected **Ralph Penn** president to succeed **Albert Penn**, now chairman of the board.

OBITUARIES . . .

Redondo Newhall, 55, vice president and Chicago district manager of **Reed & Prince Mfg. Co.**, Worcester, Mass., died Apr. 17.

Manning W. Hodgdon, 58, manager of forging sales for **Aluminum Co. of America** at Cleveland, died Apr. 22.

Samuel Botwinik, 54, president, Botwinik Bros., Worcester, Mass., died Apr. 17.

George H. Oltmann, 48, assistant sales manager in the merchant products division at Cleveland for **American Steel & Wire Division**, U. S. Steel Corp., died Apr. 20.

Harold E. Smith, 64, president, **T. L. Smith Co.**, Milwaukee, died Apr. 20 while vacationing in Paris, France.

Frank M. Giefer, president, **Twin City Steel Mfg. Co.**, Minneapolis, died Apr. 11.

William S. Newell, 76, chairman of **Bath Iron Works**, Bath, Me., died Apr. 18.

Raymond A. Morris, vice president-secretary, **Dominion Foundries & Steel Ltd.**, Hamilton, Ont., died Apr. 14.

Philip O. Geier, 77, chairman of **Cincinnati Milling Machine Co.**, Cincinnati, from 1934 until his retirement in 1946, died Apr. 21.

E. W. Weiffenbach, 43, head of **Cass Products Co.**, Buffalo, died Apr. 16.

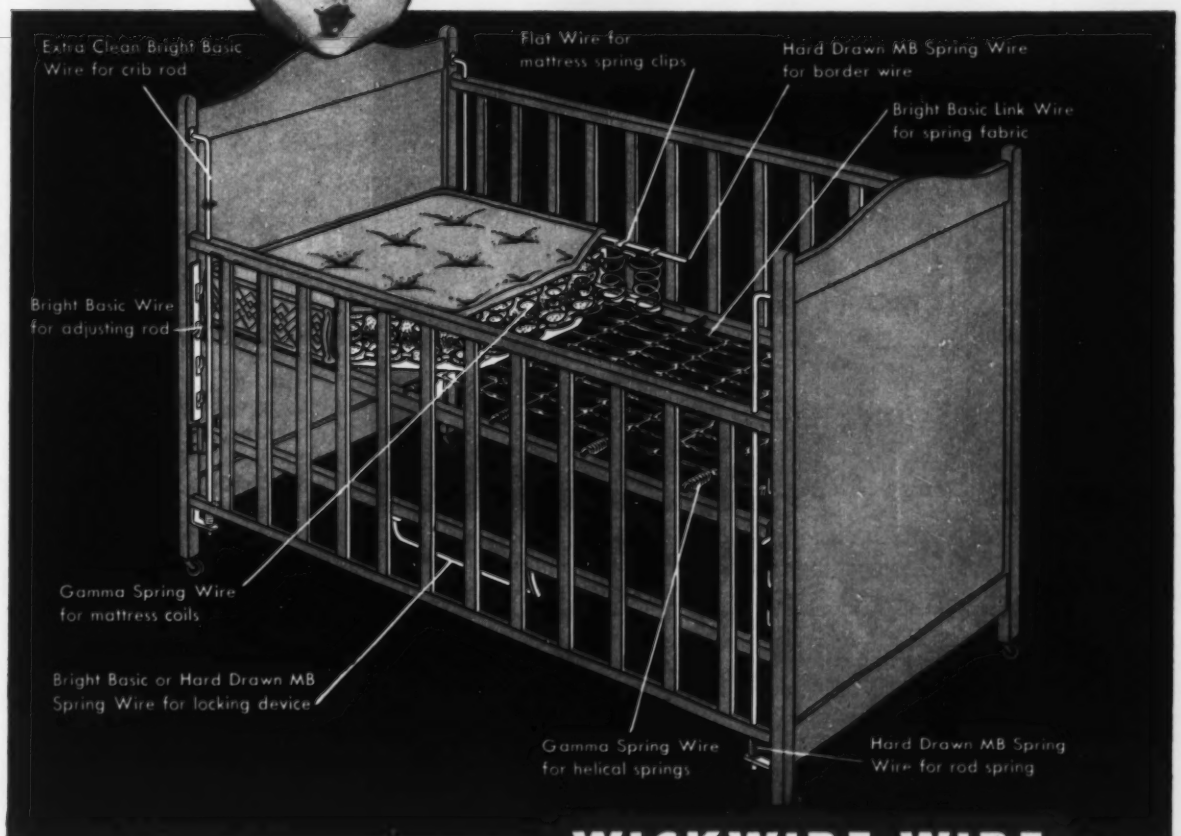
Floyd L. Greene, 65, who retired eight months ago from **General Refractories Co.** where he served as chairman and president, died Apr. 14 in Altoona, Pa.

They're our babies

Here—in a baby's crib—we find just one more example of the wide diversity of Wickwire production . . . proof of Wickwire's ability to provide you with a single, dependable source of supply for every type of wire you may need in the manufacture of your particular product.

No less than nine different kinds of wire go into the making of a typical baby's crib. And every one of them is a product of Wickwire—the result of painstaking fabrication and quality control that's complete and uninterrupted from ore to finished wire.

Yes, whatever your specifications may be—high or low carbon, in all tempers, finishes and grades—
For The Wire You Require; Check First With Wickwire.


Extra Clean Bright Basic Wire for crib rod
Flat Wire for mattress spring clips
Hard Drawn MB Spring Wire for border wire
Bright Basic Link Wire for spring fabric
Bright Basic Wire for adjusting rod
Gamma Spring Wire for mattress coils
Bright Basic or Hard Drawn MB Spring Wire for locking device
Gamma Spring Wire for helical springs
Hard Drawn MB Spring Wire for rod spring

WICKWIRE WIRE

(F)

THE COLORADO FUEL AND IRON CORPORATION—Denver & Oakland
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo
Chicago • Detroit • New Orleans • New York • Philadelphia

J&L STEEL

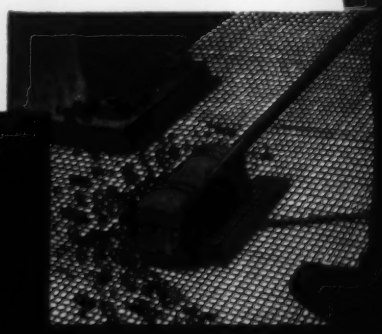
JAL-TREAD

for *safe* permanent flooring

Jal-Tread floor plate combines the strength and durability of high quality steel in an exclusive checkerboard pattern scientifically designed for *safety*.

Whatever your application . . . in new construction . . . new equipment . . . or replacement jobs, Jal-Tread will assure you of these advantages:

SAFE FOOTING—300 miniature squares per square foot—all of uniform height—provide maximum linear friction surface that protects you against lost time accidents.



EASY CLEANING—Jal-Tread's straight line gutter pattern permits quick, thorough sweeping and draining in any direction.

EASY FABRICATION—Jal-Tread's straight line pattern simplifies welding, flanging, shearing, bending, punching, and drilling operations. Experience shows that Jal-Tread can be cold-formed on standard plate bending machines.

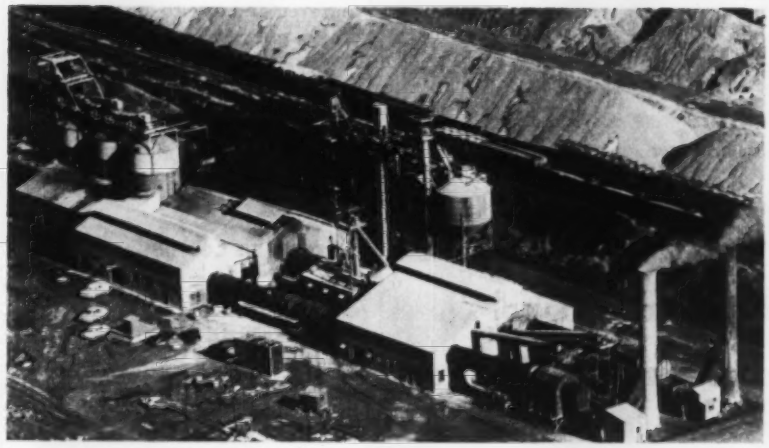
ATTRACTIVE APPEARANCE
Jal-Tread's exclusive checkerboard pattern gives a distinctive, neat appearance in all its applications.

For safe, long-lasting flooring, specify J&L Jal-Tread . . . the only true checkerboard floor plate.

Available at leading distributors everywhere

Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*

J&L STEEL



Marblehead Lime Co.'s Thornton, Ill., plant . . .

New Facility for Producing Clinkered Dolomite

A PLANT which affords high-quality control in production of clinkered dolomite has been put into full operation at Thornton, Ill., by Marblehead Lime Co., a subsidiary of Material Service Corp., Chicago. Clinkered dolomite is a refractory material used to maintain the bottoms of basic open-hearth and electric furnaces in the production of steel.

Lester Crown, vice president, says the second of the plant's two gigantic rotary kilns was added because of an increasing use of clinkered dolomite by the steel producers, the proximity of the plant and the adjacent Thornton quarry to one of the nation's leading steel producing centers, and the Thornton quarry's large deposit of high-quality dolomitic limestone.

Plant Features—Unique features of the plant are: A control system which permits one man to visually and manually control the entire operation; a specially engineered dynamometer drive system which controls the kiln's rotation speed and accurately proportions the limestone, iron oxide and coal; an induced draft fan for top combustion efficiency; and a chilling system which produces a clinkered dolomite with better storage qualities.

The giant kilns are 250-foot long tubes, each 9½ feet in diameter. Each kiln is powered by a 100-hp motor and revolves at a top speed of 30 seconds per revolution. The kilns operate 24 hours per day, shutting down only for repairs. They were made by F. L. Smidth Co., New York.

The Marblehead Thornton plant also has two smaller kilns which produce dolomite lime for the construction industry, glass manufacturing, oil purification and chemical uses.

Marblehead Lime Co. also has plants at South Chicago and Quincy, Ill., and Hannibal, Mo., which produce high-calcium lime for steel fluxing, oil purification, water treatment, leather tanning and chemical uses.

Todd Buys Los Angeles Unit

Todd Co., Rochester, N. Y., maker of check-writing machines, purchased Standard Bank Check Co., Los Angeles, for expansion of manufacturing facilities.

U. S. Steel Improves Facilities

Renovation of ingot mold production facilities at U. S. Steel Corp.'s Edgar Thomson Works, Braddock, Pa., is nearing completion. Extensive modernization of the gray iron foundry, begun in 1953, will be completed this fall.

With rebuilding completed, the foundry will contain 88,000 sq ft, an increase of about 20 per cent over area of the old foundry.

Production capacity will be more than 250,000 tons of molds annually. Entire output will be used by U. S. Steel plants. Molds produced will weigh between 7800 and 60,000 lb. E. A. Graham is foundry superintendent at Edgar Thomson.

Furnacemaker Building Plant

C. I. Hayes Inc., Providence, L. I., is building a plant at Cranston, R. I. Activities of the company, now dispersed among six buildings, will be integrated in the new building. The company makes industrial electric heat-treating furnaces.

Ford Plans $1-Million Project

Ford Motor Co., Dearborn, Mich., will construct an industrial waste treatment plant, costing nearly $1 million, to remove impurities from liquid waste from steelmaking operations at its Rouge plant. It will separate oil and solids from a flow of 80 million gallons a day.

Steel Firm Changes Name

Friedman Bros. Steel Co., Chicago, changed its name to Darco Steel & Wire Co. The firm will continue to operate Darco Metal Litho Co. as a division.

Metal Testing Station Opens

Dow Chemical Co.'s Texas Division, Houston, is operating what has been described as the Gulf Coast's first metal testing station. It is a joint venture of the chemical firm, American Society for Testing Materials, Philadelphia, and American Welding Society, New York. Its purpose is to learn more about the effects of natural forces on metals, finishes, new processes and alloys. Dow workers have installed several hundred samples of aluminum and magnesium alloys, with or without finishes. Similar testing stations have been set up on the Atlantic and Pacific coasts.

Townsend Building Plant

Townsend Co., New Brighton, Pa., is building a $1-million plant in Ellwood City, Pa. This is only the first phase of the firm's expansion program. In the future, Townsend intends to build another section for a total expenditure of about $4.5 million for a fully in-

CASE No. 260
*Refrigerator Manufacturer

ANNUAL SAVINGS OF $28,000 on original Logan Conveyor expenditure of $18,000, and improved working conditions.

Savings include:

(a) 20% Savings in Floor Space

(b) Improved Working Conditions

(c) Increased production

(d) Less damage to product

(e) Decreased Maintenance

*Customer's name on request

The best way to MEET THE NEW COMPETITION is to reduce operating costs. As shown above, it can be done with Logan equipment. Write for literature showing how Logan Conveyors are cutting costs in countless plants, the nation over. Ask for K-E-Y book. *Write today.*

LOGAN CO., 535 CABEL ST., LOUISVILLE, KY.

Logan Conveyors

tegrated factory to take the place of its present facilities near New Brighton. The first section of the plant will provide 81,000 sq ft of working space, while the whole program will provide 321,000 sq ft. The firm makes rivets, industrial fasteners and cold-headed parts.

Kaiser Buys Container Firm

Kaiser Steel Corp., Oakland, Calif., purchased about one-third of the common stock of Myers Drum Co., that city. The Myers plant has a daily production capacity of 4000 steel drums and 10,000 pails.

Timken Boosts Tubing Capacity

To meet increased demand of the oil industry for heavy-walled seamless tubing, Timken Roller Bearing Co. will erect a $278,000 continuous annealing furnace at its Gambrinus, O., plant. Completion is expected in the latter part of September.

The 175-foot furnace will have a capacity of 3000 tons of annealed seamless tubing per month. It will be gas fired but capable of using fuel oil in an emergency.

Research indicates that heavy-walled seamless tubing can be used more efficiently and economically than the forged parts formerly used in tool joints and some other applications.

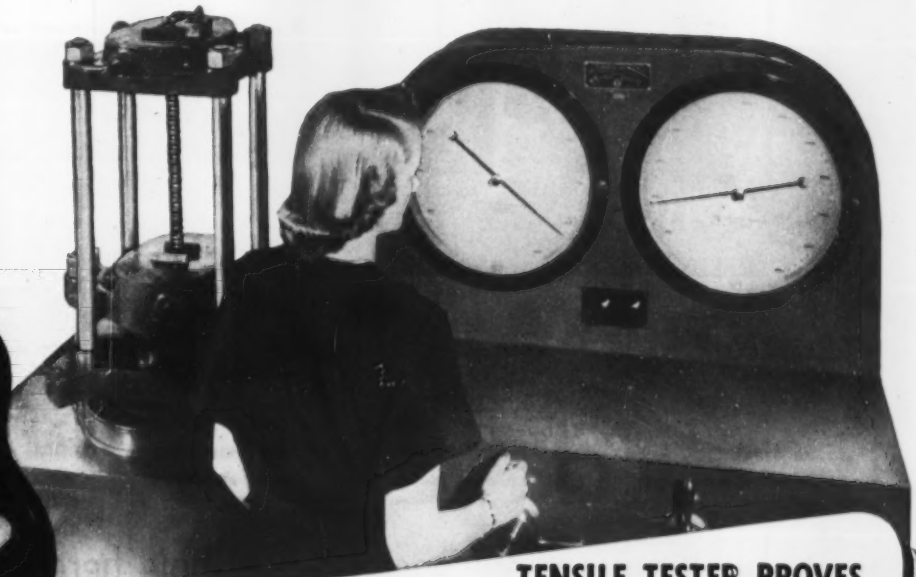
Case Buys Detroit Firm

W. A. Case & Son Mfg. Co., Buffalo, manufacturer of plumbing, heating and industrial equipment, purchased Murray W. Sales & Co., Detroit.

Electric Controller To Build

Electric Controller & Mfg. Co., Cleveland, awarded contracts for integrated plant and office buildings to be erected on Lee road south of Miles, Cleveland. The facilities will include greatly increased engineering and laboratory area to be fully equipped with testing equipment, 258,000 sq ft of manufacturing space, and mechanized equipment for low-cost materials handling. The company makes motor controls and electric lifting and separating magnets. The plant

PRE-TESTED SUPER-STRENGTH FOR *Trouble-Free* PRODUCTION



TENSILE TESTER PROVES THE EXTRA LIFE IN ATLAS ROLLER CHAIN

Tortured and torn, in tests more rugged than any you would give it in normal use, Atlas Roller Chain gives daily proof on this Tensile Testing Machine of its super-strength. You know, before you buy it, that Atlas Chain has all the strength you'll ever need . . . to stand up and take it . . . year in and year out . . . under every operating condition.

The Tensile Tester is your guarantee that every Atlas Chain drive will deliver full rated horsepower. Result . . . your machine can run at full rated speeds, with consistently greater production and lower maintenance.

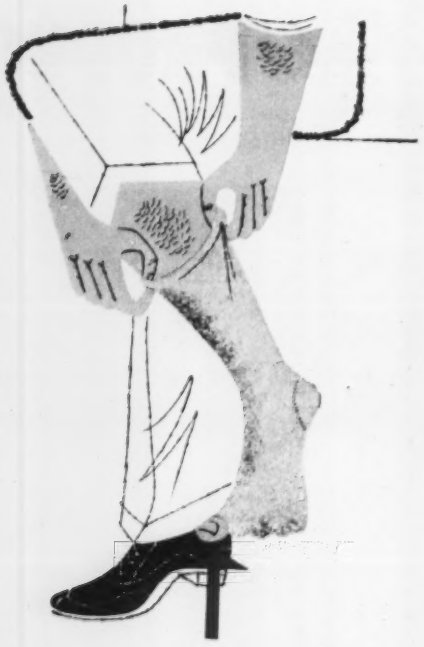
For maximum load-carrying ability and longer trouble-free life, install the chain with pre-tested strength.

Write today for the new Atlas Catalog and Handbook on roller chain. Atlas "Super-Life" Roller Chain is available through leading distributors everywhere.

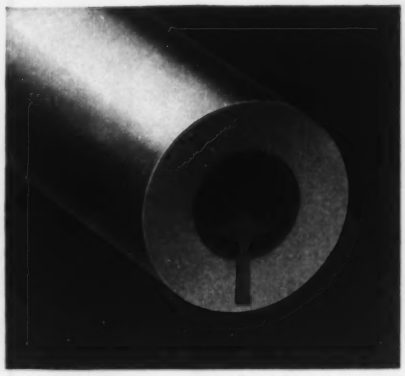
ATLAS CHAIN & MANUFACTURING CO.

PHILADELPHIA 24, PA.

ATLAS ROLLER CHAIN



a hole here is a nuisance...



a hole here is an advantage

Crucible Hollow Tool Steel Bars are saving time and money for more and more members of the metalworking industry. By using these hollow bars you eliminate drilling and boring operations, increase machine capacity and cut scrap losses.

Now, you can get hollow bars of any of Crucible's famous tool steel grades, in almost any combination of O.D. and I.D. sizes. And you can get *immediate* delivery of five popular grades from your local Crucible warehouse—KETOS® oil-hardening, SANDERSON® water-hardening, AIRDI 150® high carbon—high chromium, AIRKOOL® air-hardening, and NU DIE V® hot-work tool steels.

Your Crucible representative can point out ways to save time and money by using Crucible Hollow Tool Steel Bars.

CRUCIBLE first name in special purpose steels

54 years of Fine steelmaking **HOLLOW TOOL STEEL**

CRUCIBLE STEEL COMPANY OF AMERICA • TOOL STEEL SALES • SYRACUSE, N. Y.

is scheduled to be completed by the spring of 1955.

Hy-Pro Tool Boosts Capacity

Hy-Pro Tool Co., New Bedford, Mass., will increase its plant's manufacturing floor space by about 50 per cent. Most of the space will house tap machinery and equipment now being manufactured especially for the firm.

Conlon-Moore Buys Equipment

Conlon-Moore Corp., Chicago, purchased the machinery, tools, dies and other equipment used by the former Conlon Bros. Mfg. Co., that city. The company makes clothes washers and ironers.

Will Build Wire Rope Plant

Wright's Canadian Ropes Ltd., Granville Island, Vancouver, B. C., will build a $1-million wire rope factory, replacing the company's plant in that city.

Plans Nuclear Power Plant

Duquesne Light Co., Pittsburgh, will participate with the Atomic Energy Commission, Washington, in the design, construction and operation of the first full-scale central station nuclear power plant. The site will be near Shippingport,

Waiting for Wings

Completed tail assemblies for Martin B-57 bombers are stored on wheeled racks at Baltimore plant for quick, easy movement to final assembly line

The Most Flexible "Power Package" available for Industrial Trucks!

READY-POWER

Gas-Electric Drive

Ready-Power units can be installed in minutes

You can remove Ready-Power units in minutes

Use Ready-Power on any type of electric truck

Ready-Power units can be interchanged with batteries

"Tune up" a spare Ready-Power while trucks work

Ready-Power-equipped trucks know no time limitations

There are Ready-Power models for all truck sizes

Ready-Power is the originator of gas-electric drive for electric industrial trucks!

You're invited to see READY-POWER on display

In Booth 416 at the Foundry Show Cleveland Auditorium, May 8-14

The READY-POWER Co., 3824 GRAND RIVER AVE., DETROIT 8, MICH.

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

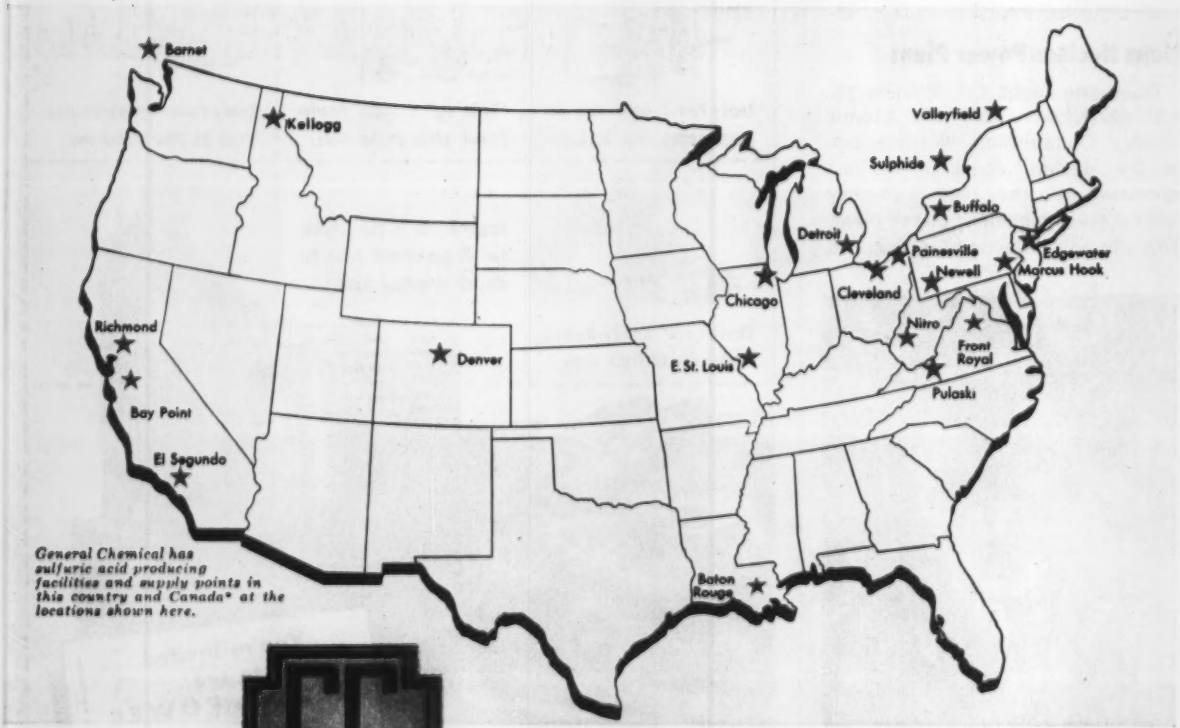
If Sulfuric Acid is one of your Major Process Requirements

...have you considered locating in these strategic spots? ★

East . . . West . . . or wherever else sulfuric acid is required, General Chemical keeps pace with industry, creating new and better facilities to serve industry's ever-growing demands . . . to assure fast, efficient service!

Today, General provides twenty-one sources of supply in industrial centers across the country. Each is well geared to serve regional requirements, offering customers the advantages of "next door" location to General's modern plants. Virtually every one of these areas is strategically situated . . . ideal for new industrial developments, with large acid facilities already installed to provide their needs.

If you are considering a new plant location . . . and sulfuric acid is one of your major process needs . . . why not discuss your plans with a General Chemical representative? Perhaps he can provide vital information on acid availabilities that will help you in your decisions.



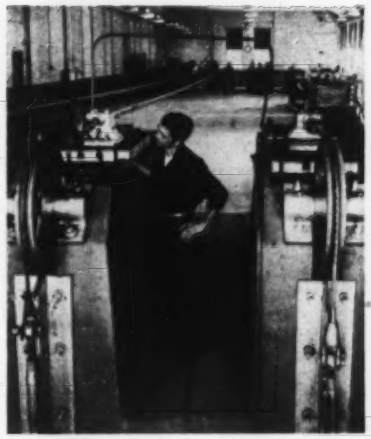
General Chemical has sulfuric acid producing facilities and supply points in this country and Canada at the locations shown here.*

Basic Chemicals for American Industry

Allied Chemical

GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.
Offices in Principal Industrial Centers from Coast to Coast
***In Canada, The Nichols Chemical Company, Limited**

A Better America Through Chemical Progress • **CHEMICAL PROGRESS WEEK** • **May 17 to 22, 1954**



Studies Cable Vibration

Spans of ACSR are shown being tested for vibration at Alcoa's research laboratories, Massena, N. Y. Specimens must withstand 500 million cycles successfully before the cable they represent will be passed for service

Pa., on the south bank of the Ohio river. The nuclear reactor itself, a pressurized water reactor, will be constructed by Westinghouse Electric Corp., Pittsburgh.

Galvanizers Honor Finkbone

B. P. Finkbone, product engineer, research division, Armco Steel Corp., Middletown, O., received the 1954 award of the Galvanizers Committee of the American Zinc Institute at the institute's annual meeting in St. Louis. The award was in recognition of Mr. Finkbone's distinguished service to the Galvanizers Committee and to the galvanizing industry. Mr. Finkbone, who has been associated with Armco since 1910, was closely connected with development of the first continuous line for galvanizing sheets.

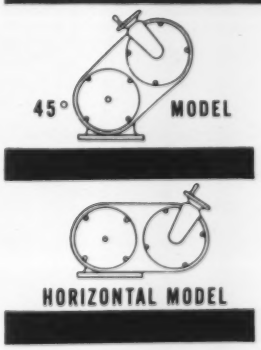
REPRESENTATIVES

Snyder Tool & Engineering Co.'s Arthur Colton Co. Division, Detroit, is now handling its business in the Midwest territory from its office at 5807 W. Diversey, Chicago. Arthur R. Pearce, manager of the Chicago office, is in charge of the Midwest territory. W. J.

(*Please turn to page* 92)

REEVES

Fractional HP Motodrive



NEWEST DESIGN FOR VARIABLE SPEED 112 ASSEMBLIES

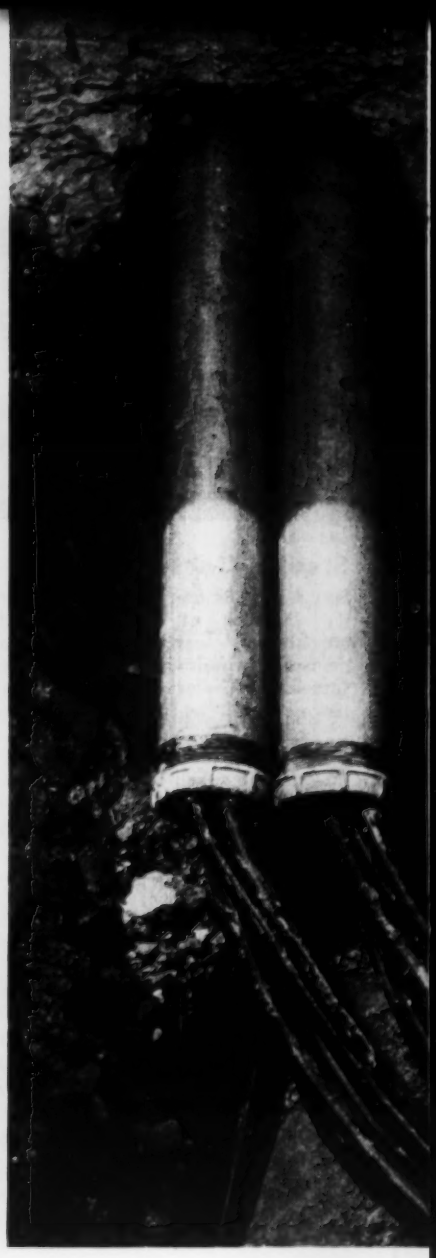
to choose from— engineered to your exact requirements!

CHECK ALL THESE NEW, REEVES FEATURES

1. New redesigned, more compact drive gives you speeds from 3 to 4660 RPM . . . speed ranges from 10 to 1!
2. New "all-position," 14-turn handwheel gives operator sensitive, minutely-accurate speed control from a position most convenient for the installation!
3. New "all-position" output shaft permits driving in any direction—horizontal or vertical down!
4. New spiral groove lubrication with exclusive overflow outlet provides complete lubrication of all sliding surfaces for trouble-free operation at all times!

REEVES PULLEY COMPANY • COLUMBUS, INDIANA

Send Today for Complete Information! Specify Bulletin S7-M543.



. . . FOR PLANTS

How to get premium wiring for little more

The cable to use is DURASHEATH.
Its actual over-all cost is so little more than the cheapest cable

Wait! Before you buy cable on price alone, see how *little* a premium wiring job actually costs. And what good insurance it is!

When you're wiring up, for power or lighting, the price of wire and cable is but a *fraction* of the over-all cost. Simple arithmetic follows – *it makes very little difference in the total cost of the job* whether you buy

. . . FOR UTILITIES

. . . FOR COMMERCIAL BUILDINGS

than you now pay

the cheapest cable or a premium cable like neoprene-jacketed Durasheath*.

But what a difference there can be in performance!

Anaconda's Durasheath is tough . . . heat-resistant . . . long-lasting. Its rugged neoprene jacket resists moisture, chemicals, sunlight, corrosion, electrolysis, abrasion and mechanical injury. It delivers real service dependability year after year.

And Durasheath is good for almost any job you have. You can bury it directly in the ground . . . run it in damp ducts . . . string it overhead . . . in *one continuous run* with minimum splicing. Order through your Anaconda Sales Office or distributor. *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.*

*Reg. U. S. Pat. Off. 54366

ANACONDA®

Primary and secondary distribution cable • building wire • portable cords and cables • mine cable • magnet wire • copper, aluminum, copperweld conductors • signal, control and communication wire • wire and cable accessories.

Are You Planning for Profit with Improved Metals?

HERE'S AN OPPORTUNITY FOR YOU TO UPDATE YOUR THINKING ON THIS VITAL SUBJECT

- ☑ **READ**—How constructional, H-steels and leaner alloys are being used
- ☑ **READ**—How type affects fabrication of stainless steels
- ☑ **READ**—How the experts fit light metals into the new application picture
- ☑ **READ**—How you can take advantage of the properties of copper-base alloys
- ☑ **READ**—How titanium can play a practical role on the "commercial" level
- ☑ **BONUS**—An 8-page METAL SELECTOR covering these metals. Clip it. Keep it in a handy spot in your office or shop

COMING NEXT WEEK (May 10)

in STEEL's

MATERIALS SHOW ISSUE

(*Concluded from page* 89)

Fitzpatrick of Fitzpatrick Engineering Co., the former representative, is retiring from all business connections.

ANNIVERSARIES

Laurel Machine & Foundry Co., Laurel, Miss., is celebrating this year the 50th anniversary of its founding. The company makes saw mill machinery and parts.

ASSOCIATIONS

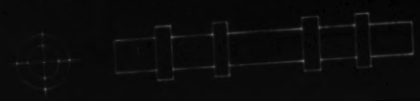
Officers of the **American Zinc Institute** were re-elected at the organization's annual meeting in St. Louis. President is Marshall L. Havey, assistant to the president, New Jersey Zinc Co., New York. Vice presidents are: Warren H. Leverett, National Zinc Co. Inc., New York; George W. Potter, Potter-Sims Mines Inc., Joplin, Mo.; and Frank A. Wardlaw Jr., International Smelting & Refining Co., Salt Lake City, Utah. Treasurer is Erle V. Daveler, American Zinc, Lead & Smelting Co., New York. Continuing as executive vice president and secretary is Ernest V. Gent, New York.

NEW ADDRESSES

West Coast Fittings Co. opened offices at 2001 Stoner Ave., Los Angeles, to manufacture tubular brass goods. Ted Lederer is president.

Investment Casting Co. moved to larger quarters at 60 Brown Ave., Springfield, N. J. The firm makes both ferrous and nonferrous precision castings.

Buehler Ltd. opened its new plant at 2120 Greenwood at Hartrey avenue, Evanston, Ill. The company offers metallurgical sample preparation equipment, optical instruments for the laboratory, testing machines and other items.



Turning

Tool tips on multiple-tool setup, turning SAE 1050 axles in as-forged condition. Best competitive steel: 6 to 7 axles per grind per set. VASCO SUPREME gives 15 axles per grind per set of tools on same job.

Boring

Boring bits, on axle hole of SAE 1060 car wheels, as forged, hardness BHN 255. Competitive steels gave 20 wheels per grind. VASCO SUPREME averages 40 wheels per grind on this assignment.

for

supreme performance

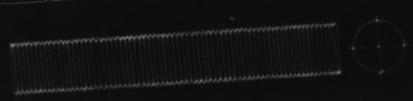
in high speed steels

specify and use

VASCO SUPREME

Milling

Shell end mills, on 30″ diameter cams for carpet looms. Regular high speed steels produced 6 cams on first grind—gave 1 to 2 regrinds. VASCO SUPREME produces 14 cams on first grind, permits 3 regrinds before too small.



Threading

A unique job for a unique steel. Glass pulling roll 16 feet long, Rockwell "C" hardness 66-68, required highly-polished finished thread (28/inch) throughout length, with diameter tolerance of .0005″. VASCO SUPREME tool cut thread 2605 feet long without regrinding, to tolerance of .0005″—one of the most remarkable performances ever recorded.

These instances of SUPREME cutting efficiency, taken at random from current report files, typify the unparalleled service to industry provided by this extraordinary High Speed Steel. VASCO SUPREME will do work no other high speed steel will do. It is often used with cemented carbide tools—and at far less cost. And there are applications where *only* VASCO SUPREME's unique combination of strength and toughness will do the job as it should be done. *Write us about your present needs.*

VANADIUM-ALLOYS STEEL COMPANY

Manufacturers of First Quality Tool and Die Steels

Latrobe, Pennsylvania

[illegible]

A JONES & LAMSON CASE HISTORY ON COST CUTTING IN THE TOOL MAKING INDUSTRY

Why Gorham Tool Co. changed its basic thinking on Metal Turning

Many companies, whose men have attended J & L Production Seminars, are revising their production standards. The Gorham Tool Co., for example.

Gorham's top production men, when visiting Springfield, saw actual production line jobs running at unusually high speeds and feeds, and also saw the results.

Now, after introducing High Velocity Turning in their own plant, Gorham reports: "much better finish on all alloy steels including 52-100, and more production per labor hour. We are going into more horsepower throughout the plant."

It's a familiar pattern. Production men visit J & L Seminars, see for themselves the possibilities in new High Velocity Turning techniques, then use them to improve production and cut costs in their own plants.

"Our basic thinking relative to metal turning changed after attending a J+L Seminar. We awakened to possibilities we had never before suspected."

J. L. PRIBK
General Superintendent
Gorham Tool Co.

PRODUCTION P.S. STUDIES ➤ *Investigate what J & L's research findings can do for your production.*

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STEEL

May 3, 1954

Technical Outlook

MORE PAY LOAD—As soon as the airframe builders are satisfied that the problem of machining embrittlement has been licked, look for a tremendous upsurge in the use of titanium bolts and fasteners in commercial and military planes. Just on a straight substitution—titanium for steel—an average-sized plane will gain upwards of 1000 pounds of load capacity.

PORCELAINIZED ALUMINUM—Aluminum surfaces can't be porcelain coated in the conventional manner for an obvious reason—ceramic firing temperatures would melt the aluminum. But the flame spraying of powdered ceramic (STEEL, April 26, p. 106) on aluminum makes a beautiful fused coating without harming the base metal.

ELECTROPOLISHED FORGINGS—"Don't sell electropolishing short," was the word passed out at the recent SAE National Aeronautic Meeting in New York. By removing ingrained oxide and cold work layers between forging operations, endurance limits of S816 and 12 chrome forged parts were boosted 20 to 25 per cent. Also reported: Compressor blades micropolished for 10 minutes at cost of one-half cent each; 1.5 to 2 mils removed from diameter, blade finish of 10 microinches.

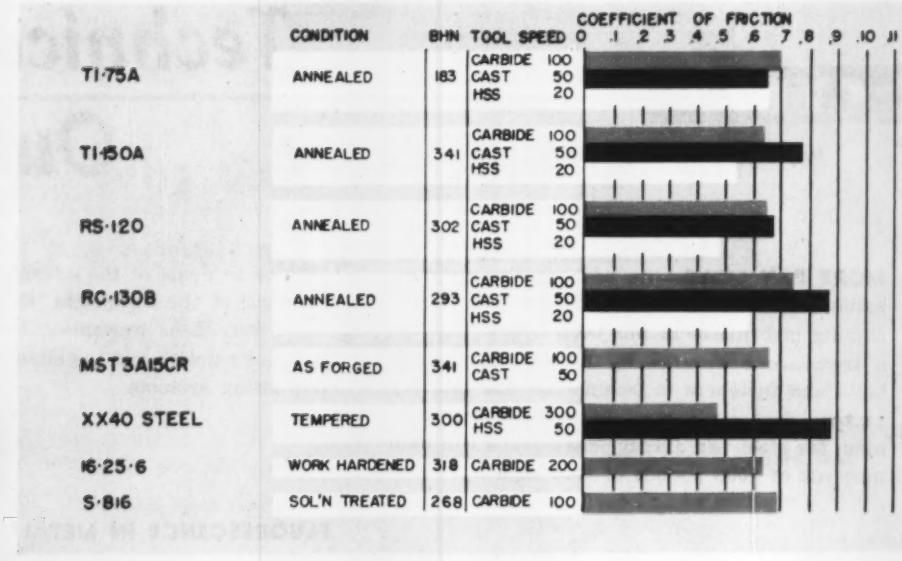
AIRLESS SPRAY PAINTING—Paint or lacquer is atomized by (1) the mechanical force of a liquid released through a restrictive nozzle and (2) vapor pressure. To get latter, finish is heated close to the boiling point of a fractional part of the solvent; boiling is prevented by pressures of 300 to 600 psi. Vapor pressure is built up, and upon release into the air, solvents burst into a gas—rate of expansion is about 1500 to 1. Some of the advantages cited by the producer of the equipment, Bede Products Inc., Cleveland: Less overspray, less danger to the operator's health and the elimination of complex ventilating systems.

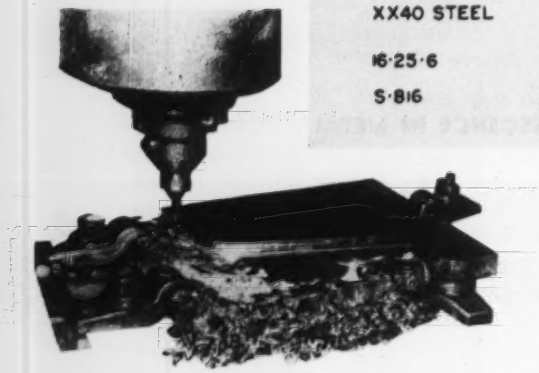
FLUORESCENCE IN METALLURGY—Role played by x-ray emission spectrography in metallurgy grows in significance. Dr. P. K. Koh, Allegheny Ludlum Steel Corp., makes this list of current applications: Thickness measurement; quantitative chemical determination of compositions of binary and complex alloys; quantitative chemical determination of minor elements in alloys; determination of impurities of heavy metals in light metals; chemical analysis of rare earth elements; detecting impurities in TIC powders; alloy oxidation study; substitutional phases and micro-radiography.

PENETRATION CHECK—Sherman Electric Co. Inc. reports development of a unit that provides manual or automatic checking of penetration of molten material into thermocouple protection tubes. It should work a considerable advantage in applications in salt-bath furnaces, galvanizing tanks and smelting furnaces.

DIECAST ASSEMBLY—Scissors, about one inch long, are being die-cast in one operation at Gries Reproducer Corp., New Rochelle, N. Y. They work and will cut paper. They're for display, but the principles are also used to produce jewelry clamps (sister hooks) chain and other small moving assemblies—with no assembly operation required. Technique, called Intercast, involves a series of overlapping molten zinc injections, allowing one section to solidify before the next is injected on top of it.

Metalworking Outlook—p. 47 Market Outlook—p. 149





In three departments—coefficient of friction, shear strength and power requirements—titanium compares favorably with steel. Its machining speeds are slow

How to Machine Titanium

The wonder metal probably works a lot easier than you thought it would. Big problem now is short tool life. Chief culprits are abrasiveness, galling, high tool tip temperatures

LATEST research indicates machining people will find that titanium and its alloys are like new neighbors. As they get to know them, they'll like them much better. Of course, there are pluses and minuses to consider.

There are at least three reasons why the new material ought to cut more easily than steel: Its coefficient of friction (generally), shear strength and unit power requirements are lower—latter is lower even if slower speeds used with titanium are counted.

It is apparent that there should be little difficulty getting good surface finishes. For example, titanium alloys work harden about 50 Knoop (500-gram load); annealed AISI 8640 steel checks out at least 150; and high-temperature, jet-engine alloys come to at least 200.

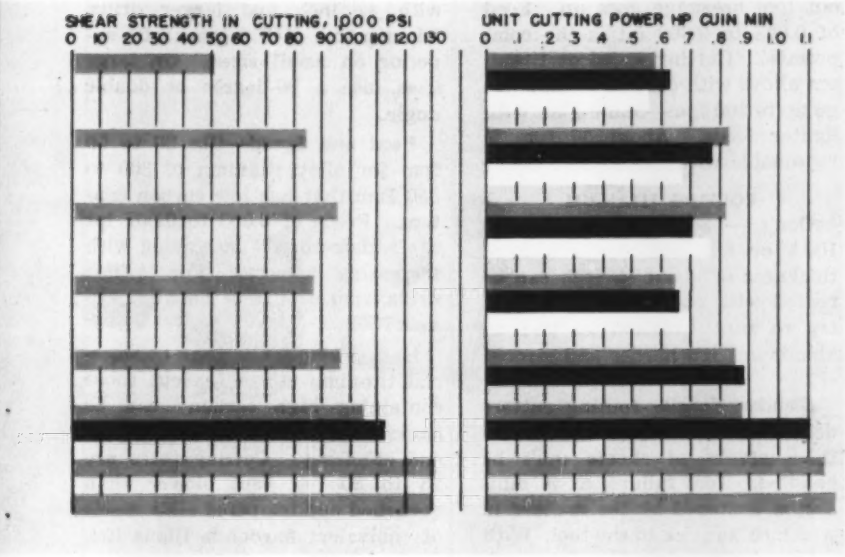
With titanium, depth of work hardening is less than 0.005 inch; while this figure may approach 0.020 inch for the other materials.

Deficits—On the other side of the ledger, we have poor tool life. High among contributing factors here are abrasiveness, galling and high tool-tip temperatures.

Basic to the understanding of the titanium machining problem is the fact that short contact between chip and tool face is characteristic of the metal. Heat is concentrated (to a greater extent than other metals) at the cutting edge—material also has low thermal conductivity. This is linked with high cutting temperatures.

Short contact also puts most of the cutting force on or near the edge of the tool. When toolface craters, it is near the edge. Total breakdown is likely to happen quickly.

Abrasiveness, Galling—Impurities to which titanium is so susceptible combine with parent metal to form extremely hard, abrasive microconstituents that may be hard to measure. In galling, titanium rubs off on tools or welds itself to them. This is especially



troublesome in milling, drilling and sawing.

Titanium cuts easily while tools are sharp. Rate of wear probably will not be linear; and, at first, tools wear slowly. After an appreciable wearland develops, wear may progress rapidly to complete breakdown. It is particularly important to keep a close watch on tools and remove them before work is spoiled.

Heat—Chief cause of dull tools is abrasive wear. Resistance to it is closely related to hardness. Temperature is the key to both. Hardness of high-speed steel tools falls rapidly at about 1000° F—practical limit of operation is generally said to be 1100° F. Carbide tools are usually serviceable at 1300 to 1400° F.

To stay within temperature limits with titanium alloys, cutting speeds are restricted. With high-speed, steel tools, speeds are about what can be expected for the hardness of the material being cut. For example, temperature of 800° F is produced at 40 fpm when Ti-150A (about 300 Bhn) and AISI 4340 steel (quenched and tempered at 300 Bhn) are cut.

Carbide tools give different results. Titanium at 300 Bhn must be machined at a speed less than 70 fpm. In contrast, the same tool will cut steel of the same hardness at about 300 fpm. At 250 fpm, cutting temperature of titanium will rise to almost 2000° F.

Temperature-feed relationship with high-speed, steel tools is not a serious factor—heaviest possible feed should never cause too much heat. Using carbide tools, temperatures rise with increasing feeds, but maximum temperatures can be held down by combining heavy feed with slow speed.

Speeds and Feeds—Commercially-pure titanium can be turned at 150 to 170 fpm with high-speed steel tools; 170 to 200 fpm with cast-alloy tools; and 300 to 320 fpm with carbide tools. High-strength alloys (275 to 350 Bhn) can be turned at 30 to 60 fpm with high-speed tools, 50 to 80 with cast alloys and 120 to 160 with carbides. High carbon materials may require much slower speeds.

For high-speed tools, feeds should be 0.004 to 0.007 ipr; 0.005 to 0.010 with cast alloys; and 0.008 to 0.015 with carbides.

Materials, Angles — Of high-speed steels, cobalt types are preferred. Cast alloy tools are satisfactory. Carbides ranging from C-1 through C-4 should be used.

Rake angles from 6 degrees positive to 7 degrees negative are satisfactory with carbides. With cast alloys and high-speed tools, use a 5 per cent positive angle.

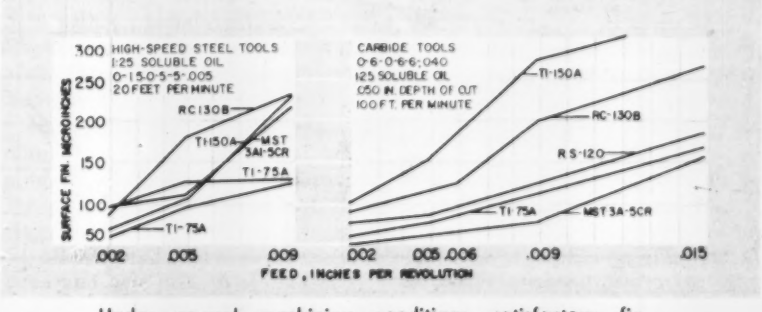
Cutting Fluids—Cooling capacity is more important than lubricating qualities. Water-base soluble oils and chemical types generally do the job.

Setup—Rigidity is important. Tool deflection causes increased smearing on the flank. To avoid seizure of the workpiece, live centers should be used.

Life vs. Speed—Carbon content is critical. Alloys with over 0.2 per cent are virtually unmachinable with high-speed tools. Oxygen and other atmospheric gases may cause difficulties. Nature of the alloy and distribution of microconstituents also are important.

Life vs. Feed—While tool life appears to shorten as feed is increased when time only is considered, the cubic inches of material removed stays practically constant over the 0.002 to 0.016 ipr feed range.

With carbide tools, number of pieces machined is independent of feed. Net result is that a great gain is made in rate of production at no sacrifice in number of pieces per tool grind. With high-speed tools, optimum feed is about 0.10 ipr, with a rather rapid loss of tool life at higher feeds. Limit-



Under normal machining conditions, satisfactory finishes can be obtained. Curves relate surface finish and feed for high speed steel and the carbide tools

ing factor with feed is rigidity of the setup.

MILLING TITANIUM

The Rub—Prevention of cutter chipping and breakage is the chief problem here. Short, individual chips characteristic of milling do not fall off but remain welded to each tooth as it emerges from the cut. On the next revolution, chip has to be struck off. But the bond may be so strong that tooth is chipped on impact.

Best solution is to place work so cutter teeth finish cuts in a direction parallel to feed. Maximum bite is taken at start of cut, so the welded-on section is only a sliver. In slab milling, this means a climb cut. Face milling calls for lining up the edge of the wedge with the emerging side of the cutter periphery—also a climb cut.

Factors—Carbide or cast-alloy tools may be used. Of the tool angles, relief is probably the most critical. Less than 10 per cent leads to excessive smearing along the flank; much over 15 degrees weakens the tool and encourages chipping at the edge. Rakes are not critical. Zero axial and radial rakes are satisfactory with Stellite. Zero axial and as much as 10 per cent negative rake are about right for carbides.

A 30 to 60-degree corner angle or a large nose radius is advantageous. They give a thinner chip for a given feed to minimize chipping. Less unit pressure also helps dissipate heat.

Heavy feeds appear to give greater production per tool grind but tool breakage goes up. Feed of 0.003 to 0.008 ipt is the compromise. Cutting speed on titanium alloys with carbide cutters can go up to 100 fpm—and higher with lighter feeds. About 50 fpm is reasonable with cast-alloy tools.

ROUTING TITANIUM

Don't — Stacked sheets of Ti-100A or RC-130A up to a total thickness of about ¼ inch can be routed with some success. Don't try to rout titanium as you do aluminum; it's harder and stronger.

Slender, fragile routing cutters deflect so much that customary thick stacks of sheets can't be handled. Tool failure, as in milling, is hastened by the manner in which chips stick to the tool. With a ⅜-inch diameter, two-flute rout, you can cut stacked sheet up to about ¼ inch thick at 150 to 250 fpm (1500 to 2500 rpm) and about 5 to 10 ipm table feed.

Tips — Relief angles should be generous. A compressed air-vapor mist also may be helpful. It also is essential to keep maximum rigidity of the spindle, cutter and work. Cutter overhang should be short as possible to minimize deflection.

DRILLING TITANIUM

Recommendations—Major problems here are chip flow, clogging and point smearing. Breakage can be minimized by using the shortest possible drill. Also use a jig. Design holes as shallow as possible.

A lubricating and chemically-active fluid is important on small drills. Coolant is more important with ¼ inch and larger drills. Blunt points (140 degrees) are superior on small sizes. On large sizes, use a 90-degree or double angle.

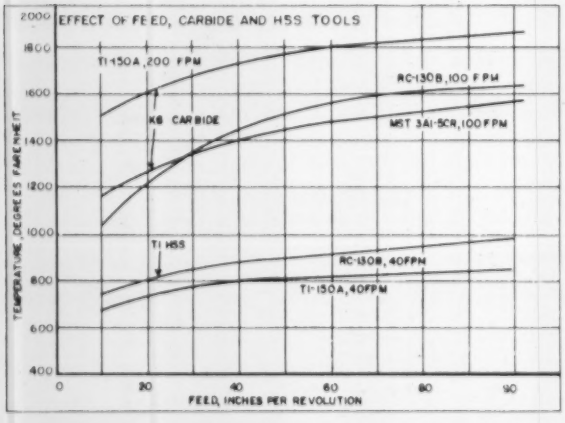
Feed and Speed—Use 30 to 50 fpm for alloy titanium of 300 to 350 Bhn that has low carbon content. Feeds of 0.003 to 0.007 ipr are satisfactory — increasing with increasing diameter. For ¼-inch drills, rpm should be between 450 and 750.

Hacksawing—All the commercial titanium alloys (except those containing high carbon) can be hacksawed with reasonable speed and efficiency. Cutting rates are 25 to 50 per cent slower than quenched and tempered alloy steels of equivalent hardness. Blade life, in terms of productivity, is at least 50 per cent lower.

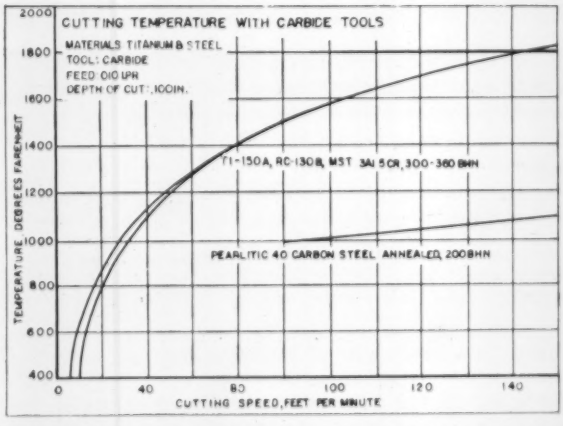
Tips — Sawing machine should be heavy duty, adequately powered, structurally rigid and free of vibrations. It should carry a positive feeding mechanism; and it should be equipped with a coolant system.

Work should be held securely and blade tension should be high. Use a torque wrench to tighten all blades uniformly. Ease blade into cut by holding back feed until well started. Blades should be fairly coarse-pitched, with 4 to 6 teeth an inch. They must be high-speed steel. Use sulphurized-chlorinated oils for general purpose work.

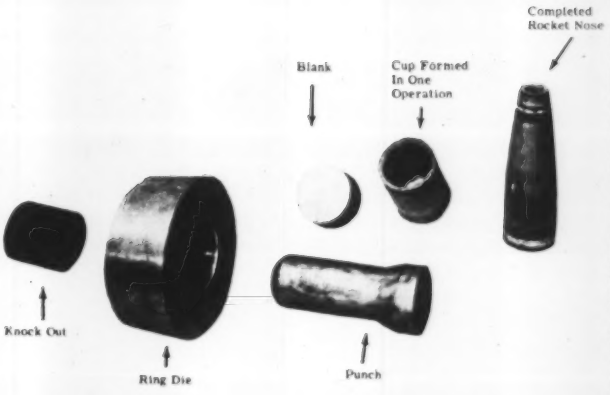
Adapted from a report prepared by Curtiss-Wright Corp. for the U. S. Air Force. It was written by James Voast. Metcut Research Associates did test work.

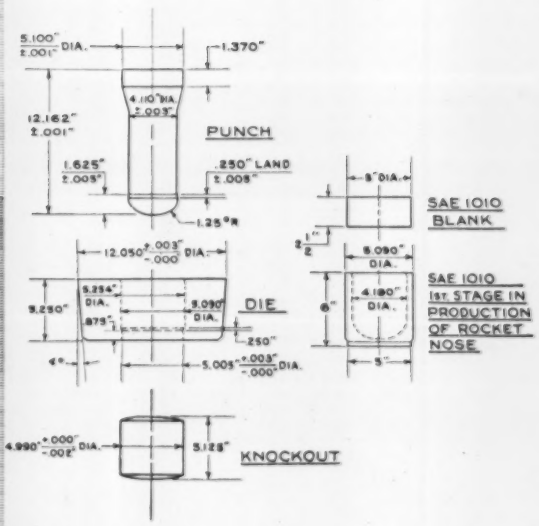


Temperature-feed relationship with high speed tools is not a serious factor. When using carbides, temperatures can be held down with heavy feed, slow speed



High tool tip temperature is a critical item in the machining of titanium. Short contact between chip and tool face is characteristic. Tool life is short





Tooling Solves a Problem

In cold extruding rocket projectile noses, success hinges on performance of tools for first operation. Here is the way one company tools up for that job

PUNCH AND DIE design is a critical factor in the success of cold extrusion of steel. Severity of the operation puts heavy demands on tool material and on its application.

In cold extruding rocket projectile noses from SAE 1010 steel, one manufacturer found the big problem in the first stage of extruding the steel slug. Once that was solved, the company's engineers figured the remaining stages of manufacture would fall into a routine pattern.

Punch — Finding tool or die steels that could withstand the strain of the impact was a stubborn problem in getting the job underway. Seventeen hundred tons of pressure are exerted on a 2500-ton press in the first operation.

Many steels, including high speed steels, were tried for the punch. Highest production from any of them was about 3000 pieces. The difficulty lay in premature upsetting and cracking of the tool steel.

Success — Final choice for the job was an 18-4-1 high speed steel, Carpenter Star-Zenith. At the last report, the punch had produced more than 14,000 pieces and was still in operation.

Heat Treat—Punch is hardened in a salt bath from a temperature of 2350° F, and then double drawn at 1050° F to a hardness of 62 to 64 Rockwell C. After drawing, punch is given a liquid nitride treatment for five hours at 1000° F. This develops a surface hardness of approximately 72 to 74 Rockwell C to a depth of about 0.001-inch.

Temperature developed in the punch during the extruding operation is about 500°F and this temperature is maintained constantly. When the press is idle between shifts, the temperature is held with a special heating jacket. Knockout is also made of high speed steel and treated to the same hardness as the punch.

Ring Die—Carpenter Vega, a manganese - chromium - molybdenum, non-deforming, air-hardening die steel was chosen for the ring die steel. When last reported, the ring had turned out 23,000 cups and was still in operation.

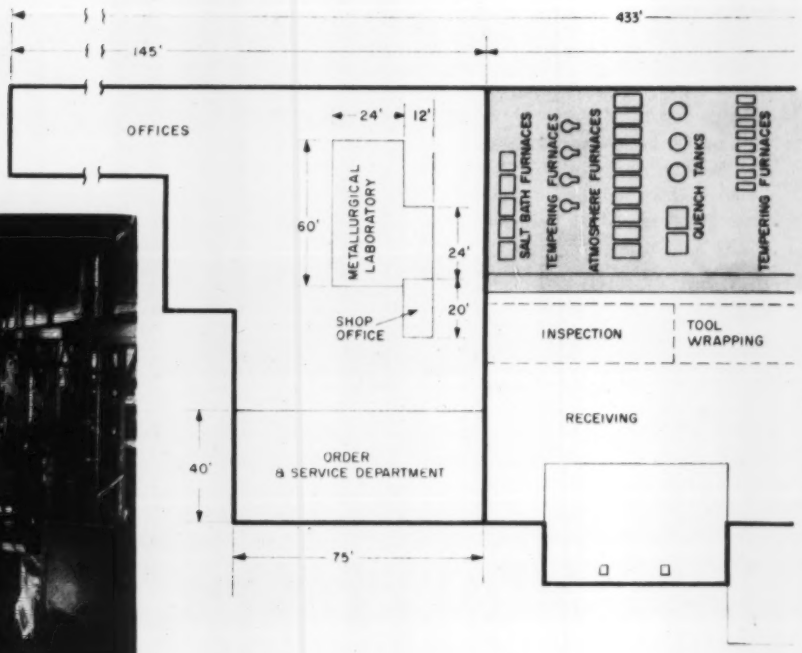
This ring is given standard heat treatment and put into operation at a hardness of 58 to 60 Rockwell C. There is no need for high temperature furnaces or packing. Scale flakes off the tools cleanly in air cooling. Another advantage is the uniform hardness from surface to center.

Part Physicals—Previous failure of the ring occurred when the strain exceeded the elastic limit of the steel. Even though the ring die is press fitted into a 4-foot diameter hardened retainer ring (34 to 36 Rockwell C) the force exerted in the extruding operation stretches the die so the inside diameter becomes too large for the close-tolerance requirements of the cup. This must be held to 0.010-inch of specified wall thickness.

Here's an indication of the degree of cold work done in this operation. During the cold forming of the 14-pound, 6-ounce slug, the hardness of the steel increases from about 60 to nearly 90 Rockwell B.

The resulting increase in mechanical properties in this and all subsequent operations meets specifications and eliminates need for final heat treatment of the finished nose.

Here is the layout of the Melrose Park plant. Three production bays are 60 feet wide. General office and laboratories are integrally housed in the production area



A Look AT Custom Heat Treating

Specialized industry has grown by leaps and bounds the past 20 years. Services range from trouble-shooting to providing heat treating facilities for the small plant

A MANUFACTURER of railroad spikes used a low-carbon, molybdenum, high-speed steel (conventionally hardened and tempered) for dies.

But performance was spotty. Some dies made several hundred kegs of spikes. Others failed after 50 to 75 kegs. What would you have done?

Chances are you and the spike people agree. They called in a commercial heat treater.

Metalworkers with a specific problem, small shops that can't afford the cost of a heat treating department and larger companies that find it pays to farm out many of their heat treating jobs, called on commercial heat treaters to the tune of over $31 million last year —this MTI figure represents about 65 per cent of the commercial heat treating industry. Significance of this trend is pointed up by the fact that job shop heat treating sales were only $970,000 in 1934.

Typical—Inland Steel Co.'s railway accessory department, E. Chicago, Ind., the customer above, called on Lindberg Steel Treating Co., a commercial heat treater.

Inconsistent die life was first traced to the way they were made from bar steel. Grain flow was parallel to the direction of the main applied stress, which was directed against the metallurgical center of the bar. Die life was improved by using a wider bar and machining dies transversely, but further work was necessary.

Heat checking was found to be the chief cause of complete breakage. Once it started, the network of cracks acted as notches to promote rapid, fatigue-type failures.

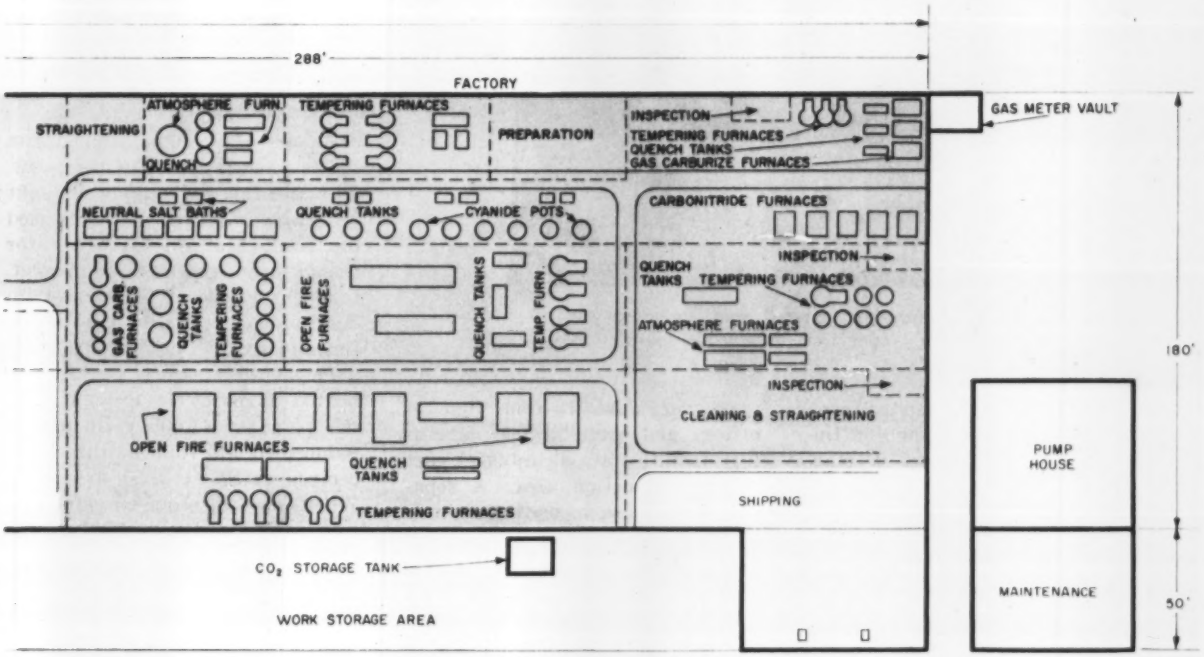
Solution—Dies were carburized to produce a tough core and hard case—latter provided compressive stresses on the surface that would minimize propagation of heat checks after they formed.

Treatment included: Pack carburization in charcoal at 1850° F to produce a case depth of 0.032 to 0.045 inch; quench in oil and triple temper to produce a hardness of 58 to 60 Rockwell C on the case; followed by blasting with sand or steel grit.

C. E. Chapman, superintendent at Inland, says die life has been increased 50 per cent.

Meeting the Trend—Demand for heat treat services prompted Lindberg, with headquarters in Chicago, to build branch plants at Rochester, N. Y., St. Louis and Los Angeles. This experience, dating back to 1946, underlined the need for an expanded in-line production facility for the Chicago and Midwest industrial community—a need now being filled by the Melrose Park, Ill., plant.

Melrose Park Offers—Quality control is the watchword here. Even though the commercial heat treater has little say-so over raw



materials shipped to him for processing, the plant has less than 0.5 per cent rejects.

Control begins when the order is written. Under supervision of an experienced metallurgist who heads the order department, orders are screened for quality, type of steel, cleaning and distortion tolerances and mechanical properties wanted. Before material is released for processing, factors, such as case depth in relation to cross-section, hardenability, poor design and insufficient bar removal, are carefully surveyed.

This prior - to - heat - treatment check is followed by the operator's inspection. He looks for seams, deep stamp marks, and verifies steel analysis by spark testing. If he thinks work is not in proper condition, the customer is advised.

Uniformity—To make for operational uniformity, each department has standard practices for equipment and material treated. The inspection department is decentralized in key areas to provide in-process and patrol inspection to back up standards. Final inspection conforms to Military Standard 105A.

Instrument and thermocouple calibration and laboratory control of atmosphere generators and salt baths are provided at all times.

Inspection department supervisors report to the plant metallurgist. So the lab is always aware of shop operations and is able to help supervisors make decisions.

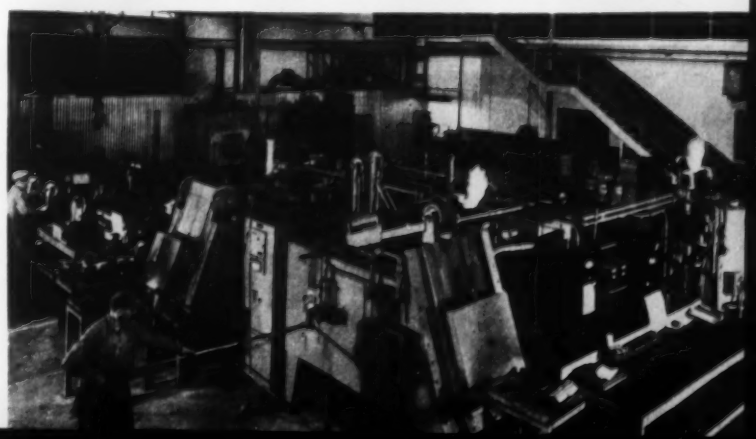
Metallurgical Lab — This unit plays a vital role. Duties of the 12-man staff include process control, engineering of heat treatments, consulting with present and prospective customers, product and fabrication development, investigation of shop and field failures, research, and development and educational activities within and without the plant.

Process control involves regulation of atmospheres to suit requirements, analysis of salt baths, measurement of control test specimens for case depth and carbon concentration and regulation of cleaning processes.

Staff is called upon to make specific recommendations for methods and processes used in the shop to meet engineering specifications. Methods of heat treatment may be established from blueprints and production figures submitted by the customer to develop accurate cost figures. To correlate fabrication and heat treating methods, the lab also cooperates with the engineering and metallurgical staffs of customers at their plants.

In the interest of highest quality at lowest cost, the staff works closely with the customers and steel suppliers. Daily questions in-

Furnace in foreground is an L-type atmosphere hardening unit. Endothermic generator is on the right



This section of lab includes cutting and grinding room, specimen polishing room and microscope bench

clude: "What steel shall I use? How much shall I allow for finishing? What hardness is most desirable?" Recommendations are followed up to establish performance and develop case histories.

Field Work—This is another major area of concentration. Anyone heat treating a large number of different parts and materials will run into occasional trouble. Parts crack, warp, fail to harden, blister, pit, etc. Trouble comes during or after processing and requires rapid investigation.

The lab co-operates with manufacturers by investigating field failures to determine whether they can be attributed to metallurgical causes. Where they are eliminated from the picture, other pre and post heat treatment operations are examined.

Production and customer requirements dictate the activities of the research laboratory. As requirements become more stringent, new techniques, processes and equipment may be necessary. The research lab translates new requirements into shop routine.

Layout—Plant production is located in three bays that are 60 feet wide by 288 feet long. All are serviced by multiple cranes that operate at 51 fpm. General offices and metallurgical laboratory facilities are an integral part of the production area. A separate warehouse is used exclusively for the storage of raw materials, heat-resisting alloy fixtures, pots, etc.

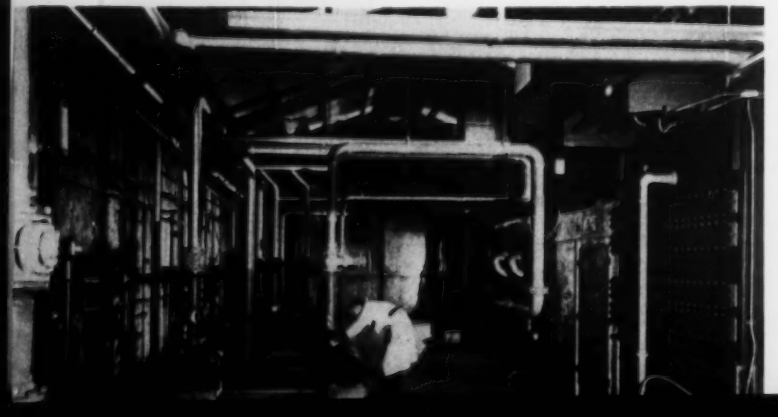
Quenching Media—Oils, water and brine are stored in tanks housed outside the main building. They are pumped overhead into the numerous quench tanks within the plant. Media are returned to storage tanks by gravity. They are pumped through evaporator-type coolers in this "pump house."

Compressed air is used to actuate furnace doors, elevators, fixtures, etc. Quench oils are filtered by a gravity-type filter in which oil is passed through a filter paper on a continuous basis.

Six steel and one concrete storage tank, along with 37 quench tanks, have facilities for changing media from straight mineral oil to a fast quench oil, from water to brine, etc. Six quench tanks contain Niter-nitrate salts for austempering and martempering.

Fire protection is provided by an automatically-cycled, fixed installation storage tank of CO_2 that has a 2-ton capacity. All oil quench tanks are provided with CO_2 fire extinguishing nozzles of the linear or fog-spray types. There are also several fog spray nozzles on hose reels.

Pump house includes quench media storage tanks, pumps, evaporator-type oil coolers and filtration equipment



Power—Gas meter vault is on the northwest corner of the plant. The natural gas supply is split into two systems here. One is used for plant heating, the other for firing heat treating equipment. Lindberg is one of the largest industrial consumers of gas in the Chicago area.

Power to energize electrically-heated furnaces is brought into the plant at 41,600 volts and is reduced to 460 volts by three load centers rated at 1250 kva each. Where needed, other transformers step down voltage to 220.

Blowers—Combustion air is provided by blowers housed in a separate blower room on the roof of the main building. Blowers for exhaust systems are within the plant as well.

Atmospheres — Many types of controlled atmospheres are used. Capacity is 100,000 pounds of steel a day. Endothermic generators produce on the order of 10,000 cfh to service furnaces for neutral hardening, carrier gas for carbonitriding, carburizing and carbon restoration.

Exothermic generators supply prepared atmosphere for bright annealing of low carbon steels. A steam generator makes a steam atmosphere for tempering steels and annealing nonferrous metals. Iron powder compacts are also processed in this atmosphere.

Ammonia dissociators at plant No. 1 produce atmosphere for bright hardening and tempering stainless steels and the annealing of magnetic metals and stainless steels. Dissociated ammonia is also used in nitriding steels by the Floe process. Raw ammonia is used for nitriding and carbonitriding and nitrogen for purging retort furnaces to eliminate explosion hazards.

Others—Salts are available for such operations as cyaniding, liquid carburizing, neutral hardening, tempering, martempering and austempering.

Open-fire, batch, roller-rail furnaces have a capacity of over 300,000 pounds a day for carburizing, normalizing and hardening.

FOR ROLLING HIGH...WIDE...AND HANDSOME

MIDVALE ROLLS, large or small, are built to resist wear longer

These rolls will be used in the new Mill Stand of Aluminum Company of America at Davenport, Iowa, and illustrate Midvale's ability to produce forged alloy rolls of the highest quality. This is one of the largest rolls of this type ever produced.

The other extreme is the small roll shown—4½" diameter by 16" body length for cold rolling copper and hardened to 100 scleroscope. Both are built for long life and maximum service.

What are your large or small roll problems? Let Midvale help you. Our 80 years of experience, highly skilled craftsmen, plus complete facilities for producing and shaping our steel are at your service. Our recommendations about material, hardness and design are yours to help increase your tonnage rolled of steel, aluminum, copper and other metals. Why not consult us about your roll problems?

THE MIDVALE COMPANY - Nicetown, Philadelphia 40, Pa.

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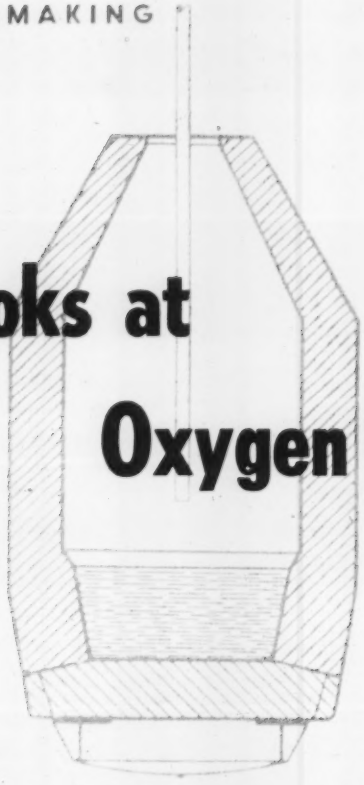

Industry Looks at Oxygen Blown Steel

Austrian process has a lot of advantages for producers on this side of the Atlantic. Gas cleaning is going to be an expensive proposition, but probably not prohibitive

AUSTRIAN steel practice employing the oxygen blown converter is not trying to replace the open hearth. It will, however, take away from the open hearth that portion of production which has to do with the refining of metals as this new process can now do this work much faster and better at half the cost.

This advantage of the oxygen converter process, now being employed in steel plants at Linz and Donawitz, Austria, was brought out in the paper entitled "American Adaptations of the Austrian Oxygen Process", co-authored by W. C. Rueckel, division manager, and W. A. Vogt, consulting engineer, Steel Division, Kaiser Engineers, Oakland, California, at the 37th conference of the Blast Furnace, Coke Oven and Raw Materials Committee and National Open Hearth Committee of AIME, Palmer House, Chicago.

Mr. Rueckel stated that the new process can refine metals with much lower chemical heat content than usual, as a consequence of the blowing with pure oxygen, resulting in the elimination of nitrogen. The converter can melt 20 to 30 per cent scrap depending on the hot metal analysis. Austrian steel plants report the efficiency of oxygen in the converter as 95 per cent. The yield of conversion from pig iron to steel is 88.5 per cent, based on actual practice. The weight of the resulting slag is about 210 pounds per ton of steel.

Pours 35-Ton Heats — At the completion of a 20-minute blow, the oxygen lance is withdrawn and the converter turned down, pouring 35 tons of steel into the ladle and giving 7.7 tons of by-products. Of this by-product tonnage, 4.1 tons will be slag, and into the gas collector system will have gone 0.5 ton of oxides as flue dust, and 3.0 tons of gas, both reclaimable. Heat input per net ton of hot metal is calculated at 2,315,000 Btu. The following factors make the oxygen process so advantageous:

High reaction rate of pure oxygen, high efficiency of pure oxygen in the converter (95 per cent) compared with the efficiency of oxygen used in open hearths (75 per cent), no oxygen bearing ore necessary resulting in heat saving and small volume of slag, no heating of 80 per cent of nitrogen in the blast, no water cooling, and recovery of CO gas fuel.

High Ductility—Claim is made that the oxygen converter steel, being noticeably free of gases, is suitable in all cases where high ductility is required. It is possible to pour 15-ton ingots of steel which has been refined to 0.02 per cent carbon and 0.2 per cent manganese without subsequent deoxidation. Unalloyed carbon steels up to about 25 per cent when compared to normal open-hearth steels show

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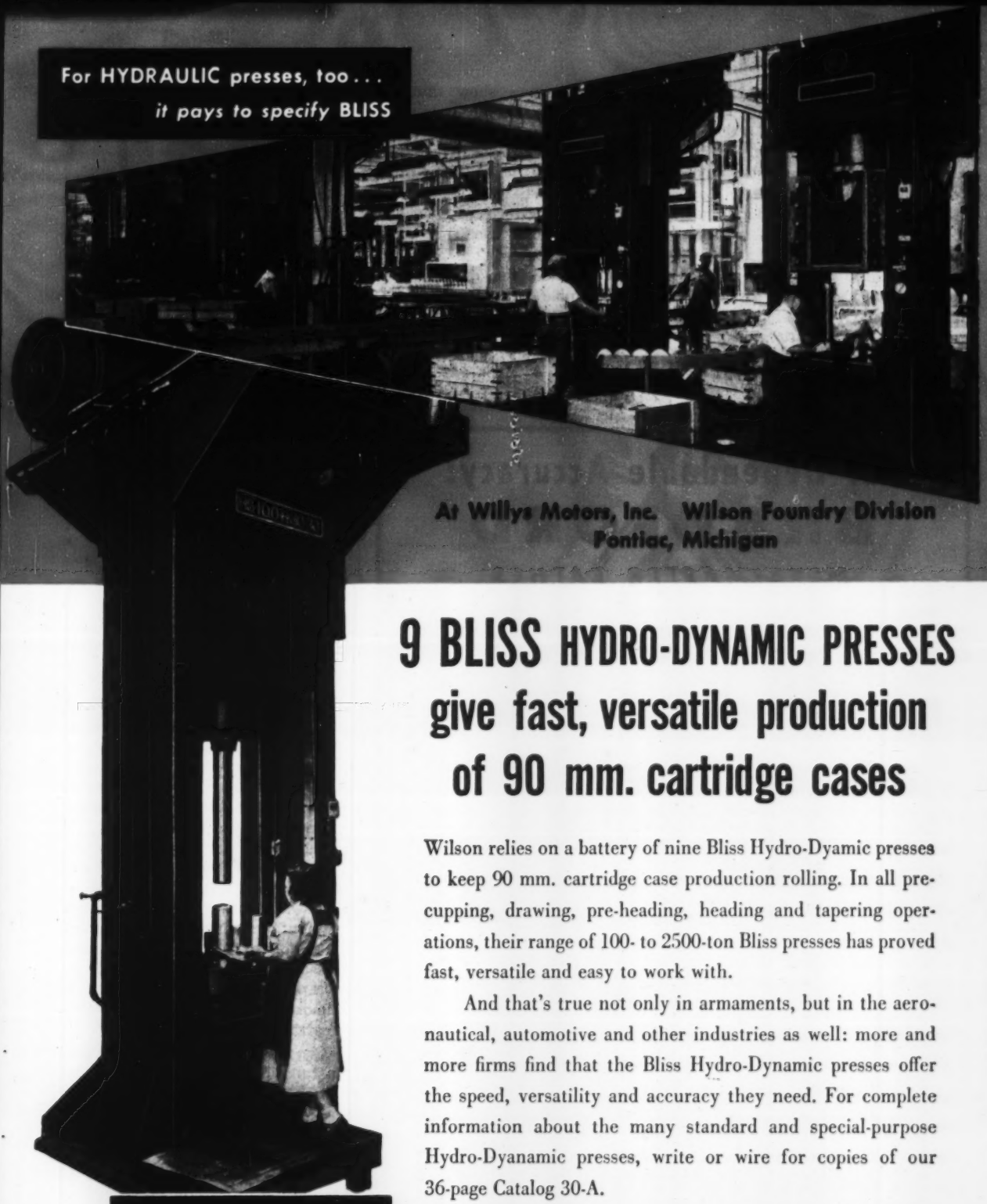

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a superiority in cold deformability and in weldability.

One of the reasons for the remarkably high degree of purity which is characteristic of the oxygen converter process lies in the high fluidity of the molten steel which facilitates rising of nonmetallic impurities to the surface of the bath. Since under such conditions it is not necessary to deoxidize, the pickup of impurities in the form of the oxidation products in the ladle is avoided.

No Difference Observed—Strain hardening curves show that the degree of strain hardening is practically the same for both open-hearth and oxygen converter steel. The latter shows no traces of pickling blisters. The tensile strength of oxygen converter steel, as rolled in the normalized condition is on the average somewhat lower than values obtained from open hearths of comparable carbon and manganese contents. Pressure welding appears to be an application for which oxygen refined steel is particularly well suited; in this field, it is definitely superior to open hearth material.

Rimming oxygen converted steel can be utilized for all applications specifying fusion welded joints to the same extent as open-hearth steel of identical composition, as there is no difference between open-hearth material and killed steel from the oxygen process. Killed low-carbon steel plates give excellent results in fusion welding which shows 180-degree bends without cracking. The theoretical yield of oxygen converter steel, excluding cooling scrap and pit scrap is 91.2 per cent which is almost identical to that of an open hearth furnace.

Gas Cleaning Problem—American installations will have to find a solution for the gas cleaning before new plants go into operation. Considering the nature of the dust in the gas evolving from the throat of the vessel, approximately 34 pounds of dust of 90 per cent minus 1 micron particles are discharged per ton of pig iron, which means that nearly 13 cubic feet of dust would be discharged during a single 35-ton blow.

Gas volume evolving from the throat of the converter depends on the volume of oxygen used and is comparatively small, approxi-

The Big Stretch

This 400-ton capacity Sheridan wrap forming machine was recently installed at Convair's San Diego plant. It is equipped to handle sheets of aluminum and other aircraft metals up to 6 feet wide and 30 feet long. A time and labor saving device, it is designed with setup panel where degree settings are centrally controlled

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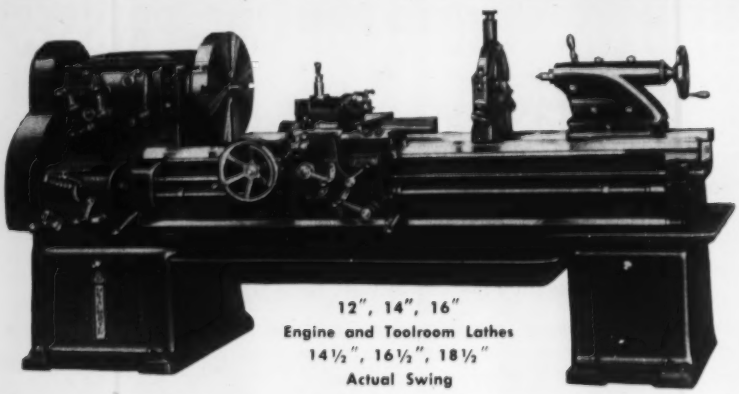

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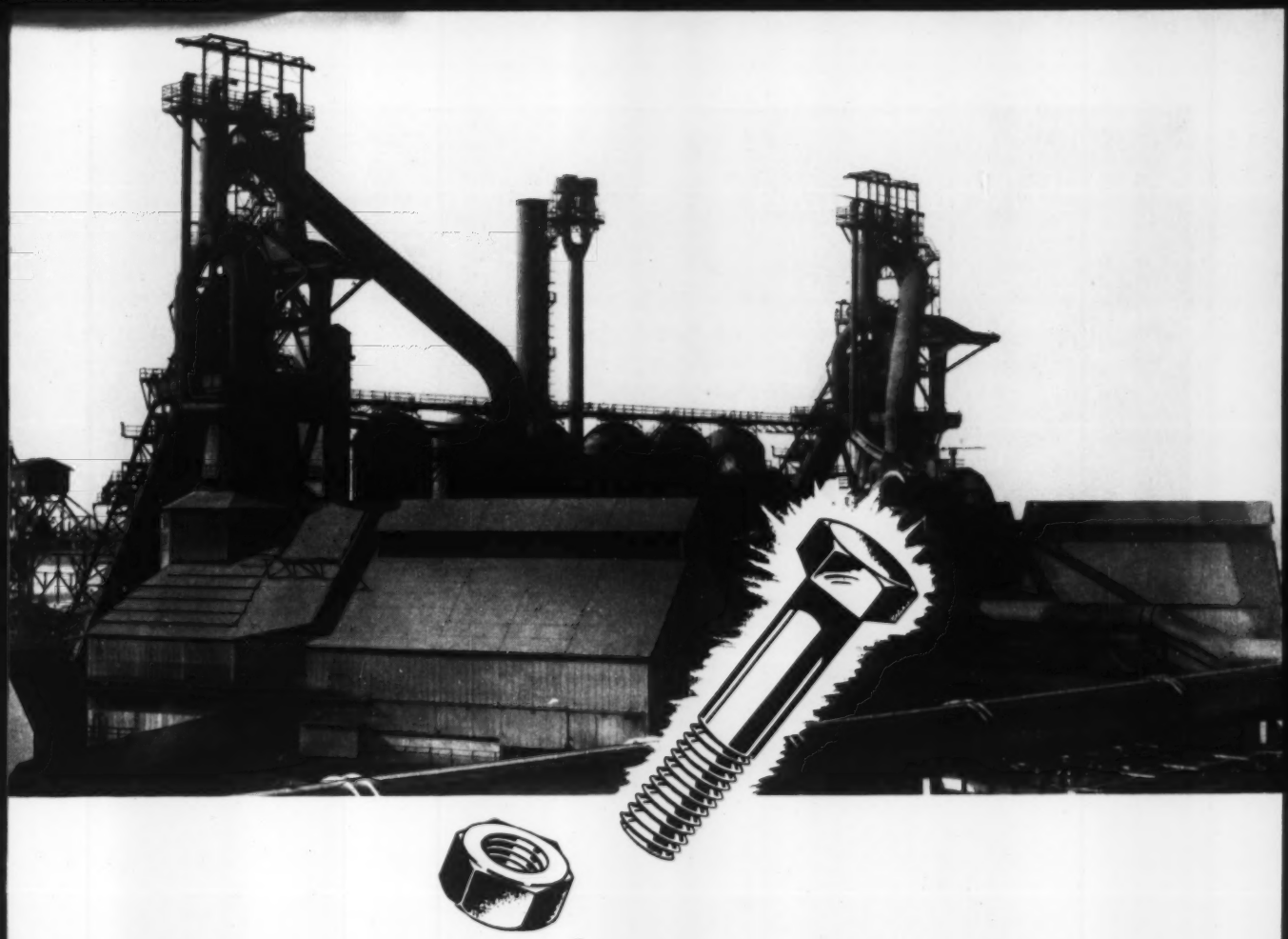

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Hole-Punching Tool

Use of cartridge-actuated punch equipment, developed by Mine Safety Appliances Co., Pittsburgh, has speeded the laying of rail at the Navy's ammunition depot at Camden, Ark. With separate firing hammer, the operator discharges the cartridge and the gas pressure generated activates the piston which forces punch through rail web to leave a precisely-sized hole

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mately 10,000 cubic feet per minute at 60° F for a 35-ton vessel. The gas consists of approximately 90 per cent CO and is discharged at a temperature of approximately 3000° F.

Cost Is High — Gas cleaning installations might amount to close to a million dollars for a good sized installation if the gas is treated in a closed system such as is employed for treating blast furnace gas. If the gas volume is diluted, the cost of the installation would go up according to degree of the dilution. The problem of the gas cleaning system is complex and that is the reason why there has been no solution up until now, according to the speaker. However, it is also attractive insofar as, by its solution, a valuable fuel gas is saved for useful application throughout the plant. In addition, iron oxide dust is recovered in a fineness which is a most desirable and highly priced material for which there is considerable demand in the paint industry.

Bessemer Speed—In his paper on "Recent Developments in European Steelmaking Practice", H. B. Emer-

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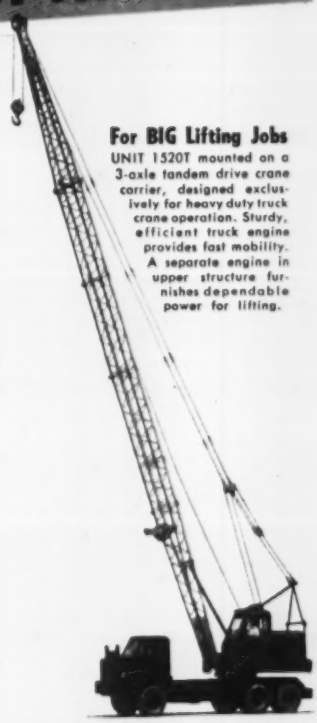

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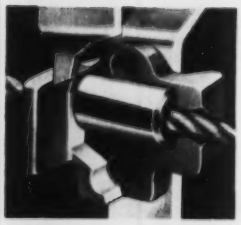

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ick, assistant director, technical services, Jones & Laughlin Steel Corp., Pittsburgh, mentioned that in the oxygen converter process molten blast furnace iron is refined to steel in a basic-lined solid bottom vessel by directing the jet of 98 per cent pure oxygen vertically, at high velocity onto the surface of the hot metal bath. The resulting product is comparable in quality with basic open-hearth steel, yet the production rate is on a level with the conventional bessemer converter process. The capital investment and unit conversion cost are much lower than for an open-hearth shop of equal capacity.

The process, Mr. Emerick pointed out, will accommodate iron of a type which is normally unsuitable either for the open-hearth or the conventional converter processes. Hot metal mixers are employed to insure satisfactory uniformity of iron compositions for best temperature control.

Building Two Plants — Discussion of the foregoing two papers brought the announcement that the pilot oxygen converter plant in operation at Dominion Foundries & Steel, Ltd., Hamilton, Ont., is producing 100 tons of steel per day using ordinary basic iron and 22 per cent scrap as charge metal. Metal blown to the end point has the following analysis: Carbon plus or minus 1.3, manganese depends upon the manganese content of the hot metal, phosphorus controlled under 1.5, and sulphur averaging 0.018 per cent. About 2100 cubic feet of oxygen is used per ton of ingots.

A 160-ton high purity oxygen plant has been purchased by the McLouth Steel Corp., Detroit, to serve three 40-ton closed bottom converters which, in conjunction with a 28-foot hearth blast furnace, are planned for future installation. Metal is to be oxygen blown to 40 per cent of the end point and then charged into the two 200-ton electric furnaces. The electrics will be ready for operation in May.

Grade Iron Used — The recently completed oxygen steelmaking plants at Linz and Donawitz, Austria, operate on blast furnace metal which covers a range from

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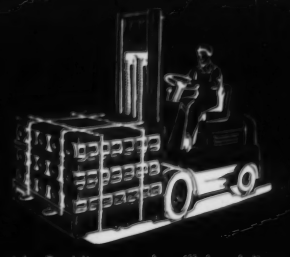

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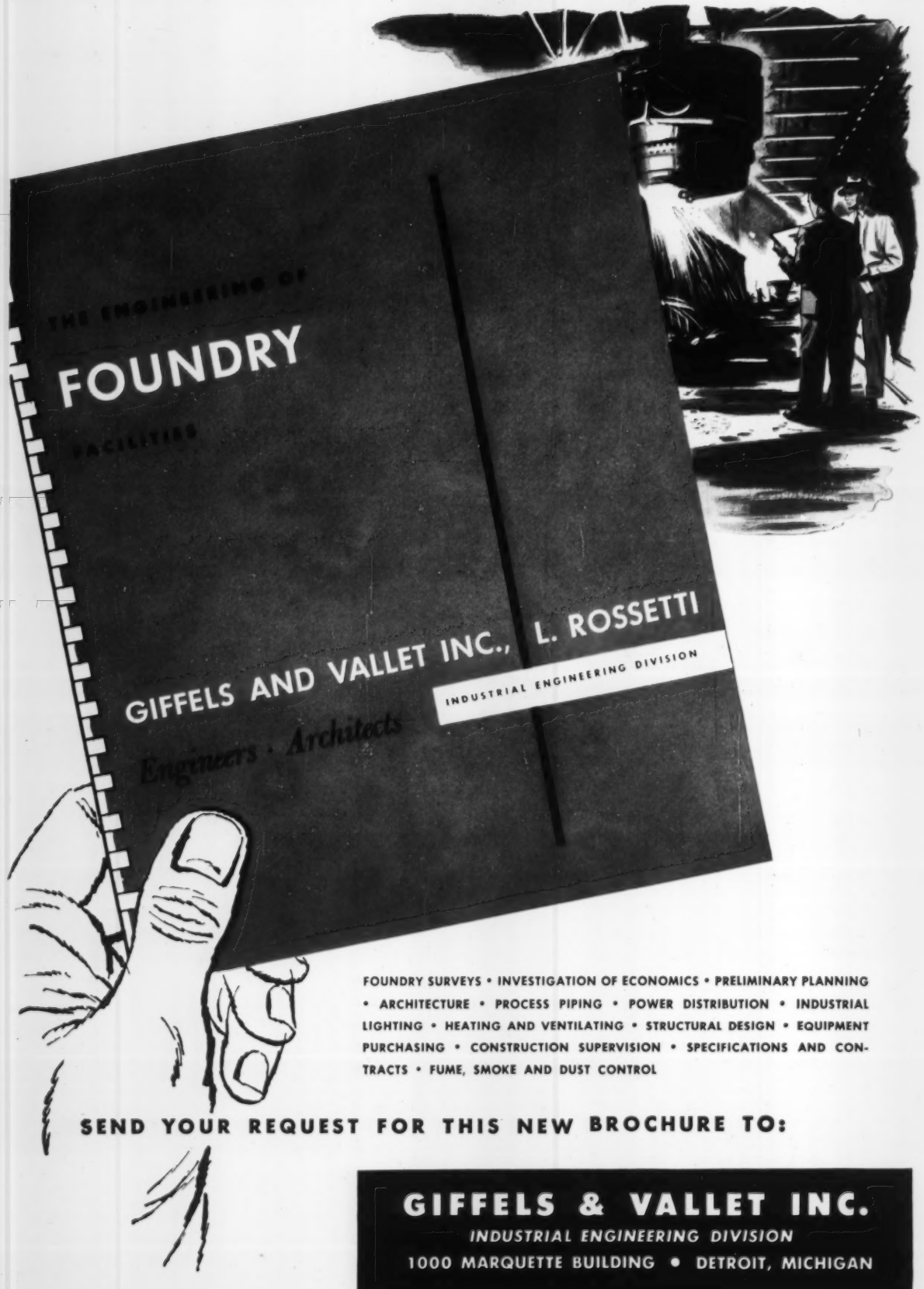

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0.2 to 1.5 per cent silicon, from 1.5 to 3.0 per cent manganese, and up to 0.25 per cent phosphorus. It has been discovered that dephosphorization can be made to take place much earlier by the addition of iron ore. Depending on the level of heat-producing elements in the iron, the normal range of scrap additions in the two Austrian production shops is 12 to 25 per cent of the gross metallic charge.

The total lining thickness is about 20 to 24 inches. The bottom is about 26 inches thick over-all. Normally, it remains in good condition indefinitely, while the body lining fails by even wear of the sidewalls in the reaction zone. The linings must be patched or replaced after blowing approximately 250 heats, or roughly after one week of operations.

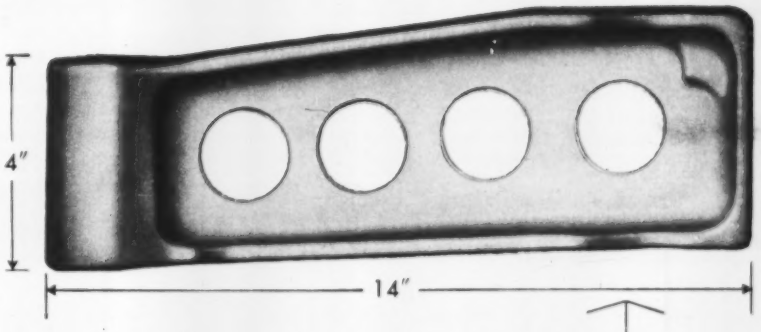
After charging the vessel with scrap and hot metal, the oxygen jet is lowered to a position several inches above the surface of the bath. Slag-forming fluxes, chiefly burned lime, are added during the blow. A brick-lined smoke hood connected to a stack discharges a dense cloud of reddish brown fumes. All heats are blown down to 0.05 or 0.06 per cent carbon and recarburized in the ladle if necessary. The endpoint normally occurs after 18 to 20 minutes and is signalled by the collapse of the carbon flame.

Yield Is Attractive—Gross yield, from metal charged to liquid steel, is approximately 90 per cent. Eighty per cent of the heats finish below 0.030 per cent sulphur and 0.025 per cent phosphorus. The material exhibits good cold forming properties and good weldability.

In a wide variety of applications, including wire products, tin plate, hot and cold rolled sheets, plates and bar products the material has held its own against basic open-hearth steel of similar carbon content.

NBS Offers Strain Gage Data

National Bureau of Standards is offering proceedings of its symposium, "Characteristics and Applications of Resistance Strain Gages." It's a 140-page volume of papers and sells for $1.50.



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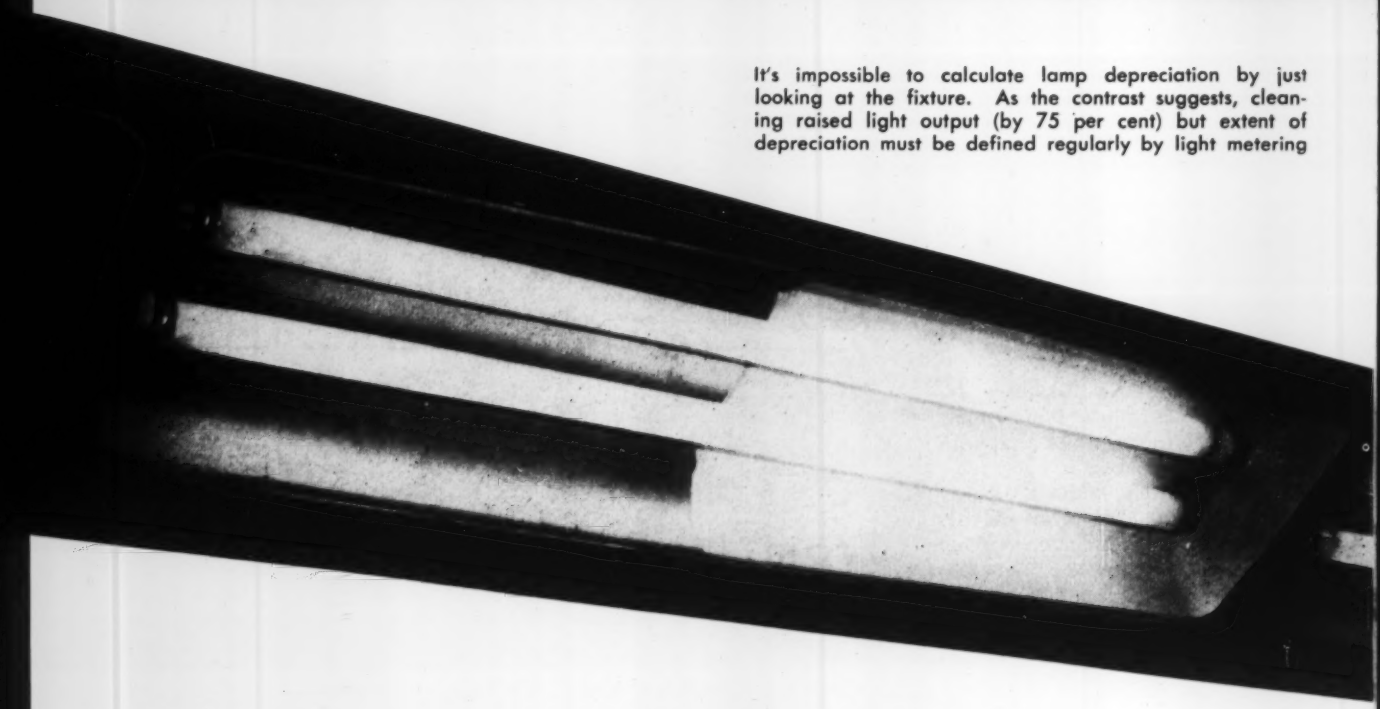


It's impossible to calculate lamp depreciation by just looking at the fixture. As the contrast suggests, cleaning raised light output (by 75 per cent) but extent of depreciation must be defined regularly by light metering

Program Your Lighting Maintenance

Lighting up-keep problems yield readily to a well-planned and executed system. Here are the basic procedures that must be followed, with tips on methods and equipment

By DON PHILLIPS
Illuminating Engineer
Lamp Division, General Electric Co.
Nela Park, Cleveland

A CAREFULLY-PLANNED, expensive, lighting installation deserves an equally well-executed maintenance program.

An inept or incomplete approach subjects the user to two costly budget leaks. On the one hand, the tie-in between levels of illumination and production means the latter suffers when lighting deteriorates. In addition, cost of operating the lighting system itself is the same even if money spent each month for electrical energy doesn't actually produce light.

Procedures to keep lighting costs in line will vary in some respects according to individual plant requirements, but will necessarily incorporate the same basic factors. Here is a general outline that defines these essentials.

Running Check—Loss of illumination is continuous, so periodic light meter readings are essential. Any lighting installation will decline rapidly in light output if nothing is done to offset effects of dust and dirt accumulation, burnouts, lamp depreciation and voltage drop.

The human eye notes lamp outages readily. But other factors that cause a steady decline in light are all but imperceptible. Periodic measurements, therefore, become vital to determining when cleaning, painting and replacement are in order.

Scheduling—Dust and dirt can reduce light output by 50 per cent in a comparatively short time. Just how short this time is in various plant locations should be the basis for a definite schedule for cleaning lamps and fixtures. Time between cleaning jobs will hinge on the meter's findings of dust accumulation rate and the practical economics of scheduling workmen's time. In some areas, cleaning every few

TABLE I

EIGHT POINTS TO CHECK FOR EFFECTIVE LIGHTING MAINTENANCE

1. Take light meter readings periodically
2. Establish a regular schedule for cleaning lamps and fixtures as determined by light meter readings
3. Maintain an adequate stock of spare parts
4. Make periodic voltage checks
5. Clean or repaint all reflective surfaces when warranted
6. Make use of special equipment available to hold down costs and simplify operations
7. Make electrical repairs immediately
8. Determine the most satisfactory and economical plan for lamp replacement

weeks may be necessary; in others, twice a year will be considered sufficient.

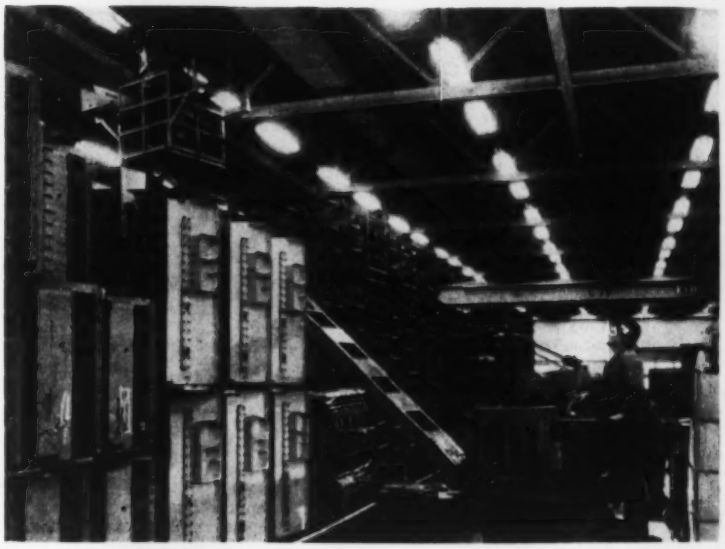
When cleaning, don't be satisfied with wiping lamps and fixtures with a damp cloth. Both should be washed thoroughly. Use of a detergent that doesn't require rinsing will save time. One approach to the cleaning cloth problem: Make arrangement for obtaining worn out diapers from a local didie wash.

Spare Parts—Failure of any part of the system will impair light output. But the loss can be minimized by an adequate stock of spare parts. This is particularly true of lamps, sockets, ballasts and starters. In fluorescent installations, use of watchdog starters is recommended highly.

Test kits containing a full line of instruments to check fluorescent lamps, starters and ballasts quickly and conveniently are a great time saver.

Check Voltage—Both incandescent and fluorescent lamps are manufactured to give a rated output at a specific voltage. To get the most light out of lamps, know the line voltage on which they will operate and make sure lamps, ballasts and starters are those designed for that line voltage.

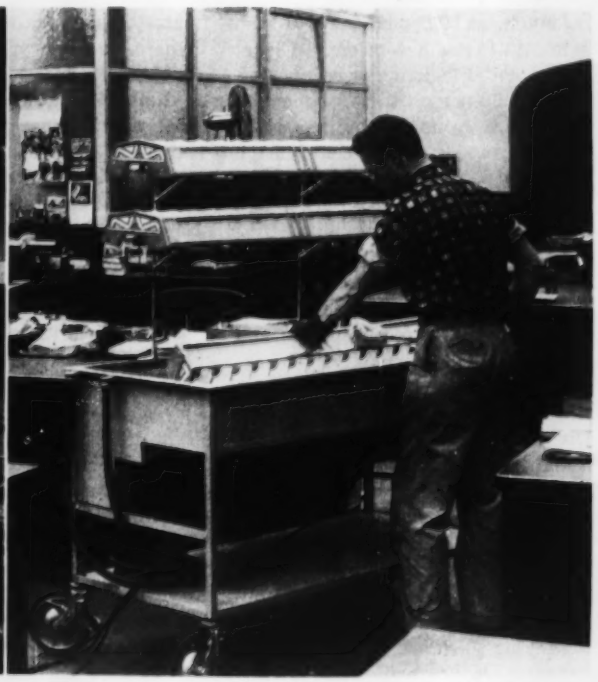
Then set up a regular system for checking out voltage to see that it stays within specified limits.



In more crowded areas, a boom truck may be necessary. These two men maintain 16,254 lamps, using this self-powered truck with elevating platform and a light aluminum rolling platform that can be assembled in 5 minutes

Reflective Surfaces — Color of walls, ceiling, floors and machines greatly affects the efficiency of any lighting installation. Therefore, it's wise to keep an eye on reflective surfaces and make sure

Fixture replacement or cleaning is simplified by mechanization. Lift is controlled by pushbuttons on the platform, water is pumped to platform from tank in machine



Portable wash and rinse tank designed at G-E's Nela Park combines washing, rinsing and drying operations. Easily maneuverable, its use can reduce washing and drying time

TABLE II

HOW TO FIGURE COSTS OF SPOT AND GROUP RELAMPING

These examples are based on the 40-w fluorescent; an hourly labor rate of $2.70 including direct overhead; and 20 minutes time to change a lamp.

First, determine these 4 basic figures:

	Example
1. Net Lamp Price Lamp list price, plus tax	88c
2. Spot Labor Cost Per Lamp Hourly labor rate divided by number of lamps changed per hour	90c
3. Group Labor Cost Per Lamp Usually 10% to 20% of Spot Labor Cost	9c
4. Number of Lamps in Installation	100

Spot Relamping in Average Lamp Period

Spot Relamping—100% Life Lamp Cost = 100 × 88c	$ 88.00
Spot Labor Cost = 100 × 90c	90.00
TOTAL COST	**$178.00**

Group Relamping for an Equal Period

Plan No. 1—Group Relamping at 80% Life—20% Spot Replacement (Selected used lamps are employed for spot replacements. Since relamping period is at 8/10 of life, costs are multiplied by 10/8 to cover an equal life period.)

Lamp Cost = 100 × 88c × 10/8	$110.00
Spot Labor Cost = 20 × 90c × 10/8	22.50
Group Labor Cost = 100 × 9c × 10/8	11.25
TOTAL COST	**$143.75**

Plan No. 2—Group Relamping at 70% Life—No Spot Replacement (Since relamping period is at 7/10 of life, costs are multiplied by 10/7 to cover an equal life period.)

Lamp Cost = 100 × 88c × 10/7	$125.71
Group Labor Cost = 100 × 9c × 10/7	12.86
TOTAL COST	**$138.57**

they're cleaned or repainted when conditions warrant.

Dark or dirty surfaces can absorb as much as 90 per cent of the light that reaches them. Clean, light-colored surfaces reflect as much as 90 per cent. Recommended reflectance value for ceilings is 80 per cent; walls, 60 per cent; bench tops, 35 per cent; machines and equipment, 25 to 30 per cent; and floors, not less than 15 per cent.

Labor Savers—For almost every lighting maintenance function, special devices are available to hold down manpower requirements and get the job done rapidly. One example is the portable wash and rinse tank designed at GE's Lamp Division. This device combines washing, rinsing and drying operations, contains calrod heating units for the washing solution and rinsing tanks.

Other special equipment available includes telescoping and mobile platforms, portable scaffolds, relamping bridges, disconnecting hangers and catwalks. Obviously, a good look at the particular operation and type of building construction involved is necessary before loading up with special equipment. Three factors that must always be considered: Operators' safety, easy maneuverability and, where necessary, noninterference with work below.

Lamp Replacement—An economical plan for lamp replacement is essential to holding down maintenance cost. In most plants, there are two important reasons why it is unwise to postpone flourescent lamp replacement until burnout. First, cost of replacing lamps individually is high; second, all lamps depreciate with use and a period eventually is reached when they should be replaced if good light levels are to be maintained. As a result, group relamping is probably the most economical in most installations.

However, any group relamping approach should follow only after thorough investigation of individual requirements. Table II advances the facts of lamp life that will affect these considerations.

Starting with a new lighting installation, the greater part of lamp life passes with few failures. In this period, spot replacement is the least expensive. But, near the end of rated life, burnout rate increases sharply. That's the time to replace the entire lot, before labor costs become prohibitive.

Most Economical Point—It is possible to relamp at the most economical point—without bookkeeping—simply by gaging relamp time by number of burnouts.

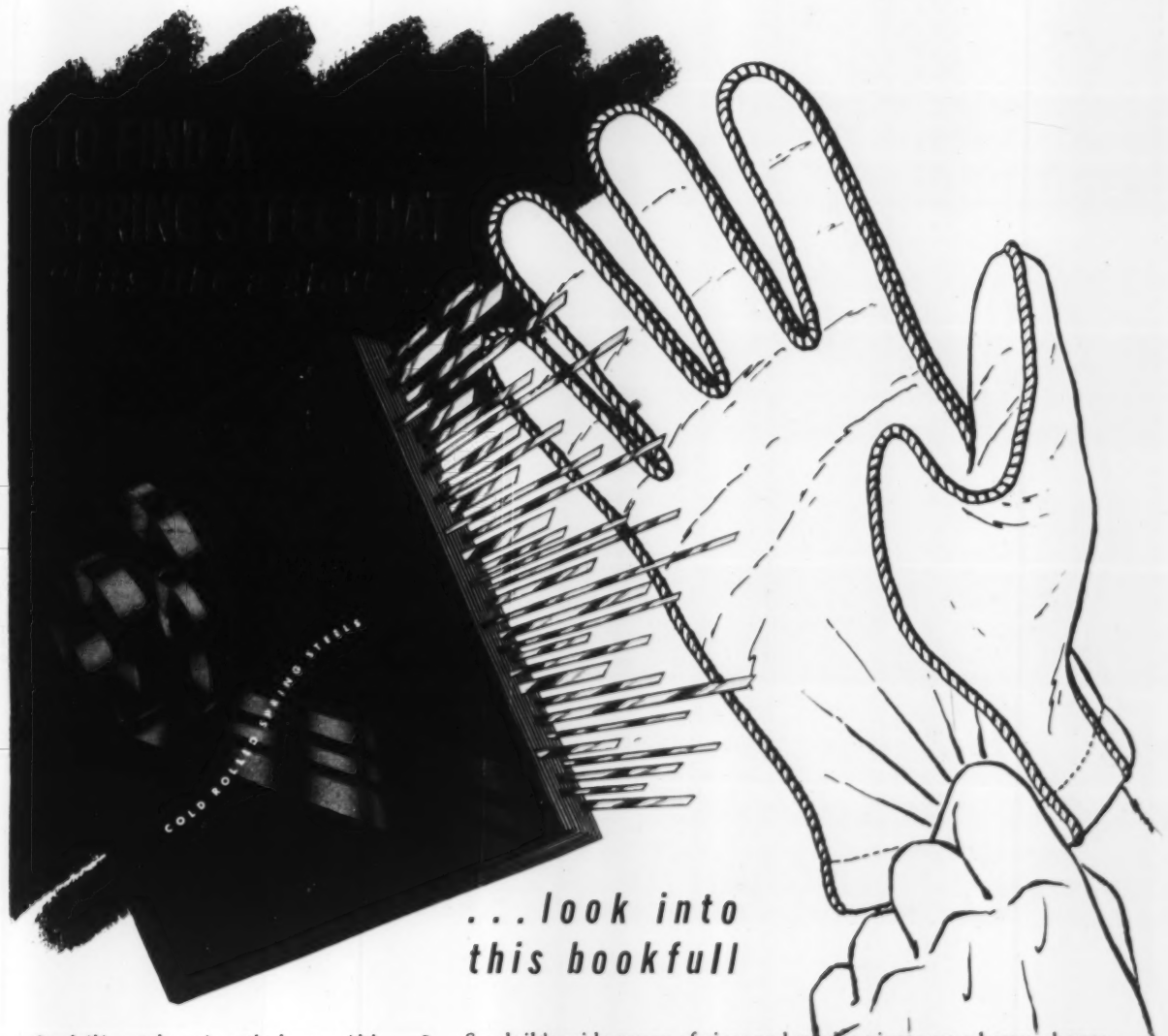
One effective plan works like this. After 80 per cent of the average life of all lamps is used up, only 20 per cent of the lamps will be burned out. The best 20 per cent of the remaining lamps is set aside or marked, while still in the fixtures, for future use as spares. Then new lamps are put in all sockets. Individual lamps are replaced as they burn out from the stock of spares. When the stock of spares is exhausted, it's time to repeat the cycle.

No Spot Replacement—A variation is employed by some firms to eliminate all spot replacements—and work interruptions—by relamping earlier in life. It's practical if some burnouts can be left in the sockets between relamping periods. An example might be found in high mounted fixtures in large areas. Savings of earlier relamping under these conditions are even more impressive than the 20-per cent burnout figure where labor cost is high compared to lamp cost.

In the latter technique, the figure used to define the replacement point is 10-per cent burnout. This will be reached when about 70 per cent of average lamp life has passed.

Cost calculations in Table II will vary with each installation. But, by substituting individual costs for those in the illustration, it should be possible to determine quickly what net cost will be on each of the three methods and which technique will be most economical.

Co-ordination — Common sense, of course, is an important factor at all stages. For example, combining operations saves manpower and eliminates work stoppages, so work should be co-ordinated at all possible stages. Two of the more obvious are relamping and cleaning. Adjustment in the schedule set up for either function should mean considerable savings in direct labor.



. . . look into this bookfull

Sandvik's catalog gives thickness width, hardness, types of edges and weight in pounds per hundred feet. Also includes useful reference tables . . . Weights of Strip Steel, Comparative Table of Wire Gauges, Numerical Conversion Tables, Hardness Conversion Tables and a Temperature Conversion Table.

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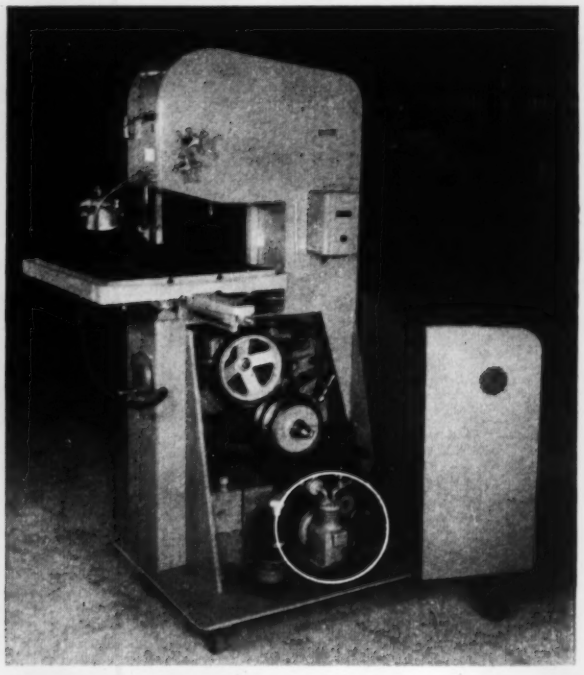

2. COMPONENT PARTS — *DeVilbiss Air Compressors supply pressure that forces a jet of air and coolant against the saw blades in DoAll Band Machines.*

DEVILBISS HELPS DoALL TWO WAYS!

The DoAll Company, Des Plaines, Ill., produces saw-band machines capable of cutting every known material. It also makes surface-grinding machines so precise they can erase a pencil mark on a slab of steel without marring the surface!

DoAll uses DeVilbiss equipment two ways: they use DeVilbiss Spray Guns and Spray Booths to paint their world-famous tools, and they use DeVilbiss Air Compressors as a component in their band machines.

Says DoAll's Clinton Rosene, "We give our customers quality throughout the machine – that's why we selected DeVilbiss equipment. DeVilbiss Air Compressors give dependable service with little or no attention. Our DeVilbiss spray-painting equipment assures attractive, long-lasting finishes."

DeVilbiss can help you improve your product with finer finishes, and with quality components such as hose, hose connections, air-line regulators and filters. Get complete facts, today, from your nearest DeVilbiss jobber or branch office; or write us direct for free literature.

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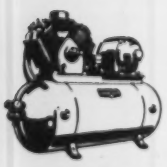
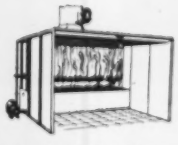


Air Compressors

Hose and Connections

Spray Guns



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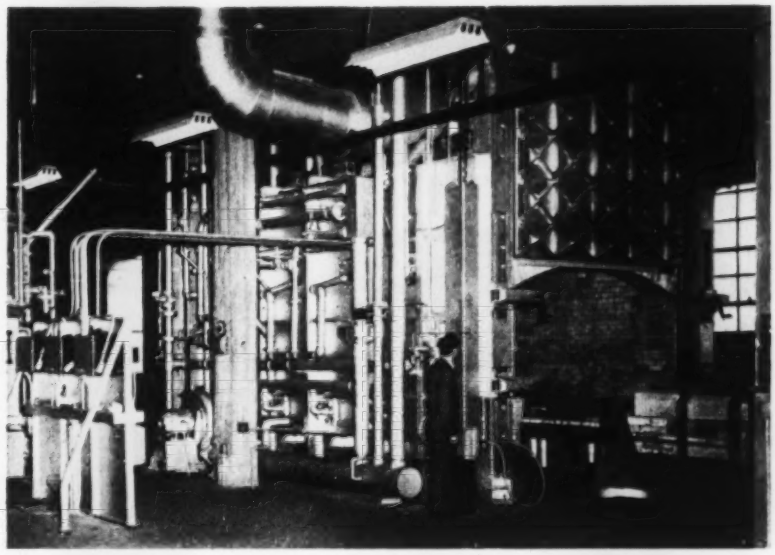


Three cars take full advantage of the furnace at all times, protect against oxidation during heating and cooling. Cars are switched in and out in 5 minutes

Car-Type Furnace Makes Heat Treating Continuous

Heat range is 1200 to 1800°F, operating on an 8-hour heating and 16-hour cooling cycle. Temperature control records externally and internally every 15 seconds

CAR-TYPE furnace makes bright annealing, normalizing and stress relieving an almost-continuous operation at Steel Processing Corp., Brooklyn, N. Y.

Three cars are used to take full advantage of furnace at all times and to protect against oxidation during heating and cooling. Cars can be switched in and out of the furnace in 5 minutes.

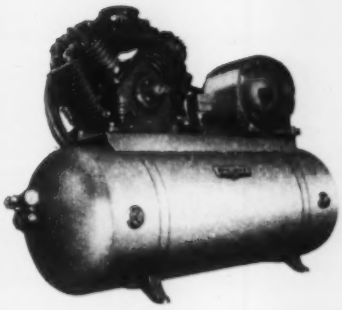
Wide range of shapes in both ferrous and nonferrous metal in individual batches up to 16 x 7 x 3 feet high and weighing up to 30,000 pounds can be handled. Installation is said to be the only bulk facility for handling low carbon steel in the New York metropolitan area; about 50 per cent of the plant is devoted to job work.

Temperature Control—The overfired and underfired Lithium Co. furnace heats in range of 1200 to 1800° F and operates on an 8-hour heating and 16-hour cooling cycle. Six zone temperature control records externally (head temperature) and internally (coil temperature) every 15 seconds. This two-point control minimizes heat loss in intermediate heat zone and allows operation of furnace at whatever head is desired.

Cars measure 200 x 84 x 42 inches high; all-welded muffle hoods of 430 stainless steel are packed with fine grain zircon sand for air-tightness. Air cooling ducts allow full annealing or slow cooling; they also serve as stiffening members to position brick work.

Heat Removal — When moved out of furnace for cooling, car is positioned at pre-located stations by limit switches. It skids over a gasket and plugs into a duct which locks in position automatically for heat removal.

Direct-fired atmosphere is used at the start in ratio of six parts air to one part natural gas. Cracked city gas is employed. Vapor compression unit lowers dew point of air to prevent decarburizing low and medium carbon steels at elevated temperatures. Lithium is employed in generator unit as catalyst to assist in cracking gases generated. Cars have built-in vaporizers for adaptation to lithium recuperative process if operation at elevated temperature is necessary in the future.



New DeVilbiss Air Compressor pays for itself

It's true. Many times a new DeVilbiss Air Compressor will actually pay for itself *out of power savings alone!* DeVilbiss Air Compressors give you up to 22.6% more air per power dollar. You gain, too, in lower maintenance and depreciation costs. If you have a compressed air problem, contact your local DeVilbiss jobber today.

Every DeVilbiss Air Compressor, from ½ to 15 hp., offers you: A Dependable DeVilbiss Compressor Unit, Check Valve Manifold, Automatic Pressure Switch, Quality Electric Motor or Gas Engine, A.S.M.E. Tank, Outlet Manifold and Quiet Efficiency V-belt Drive.

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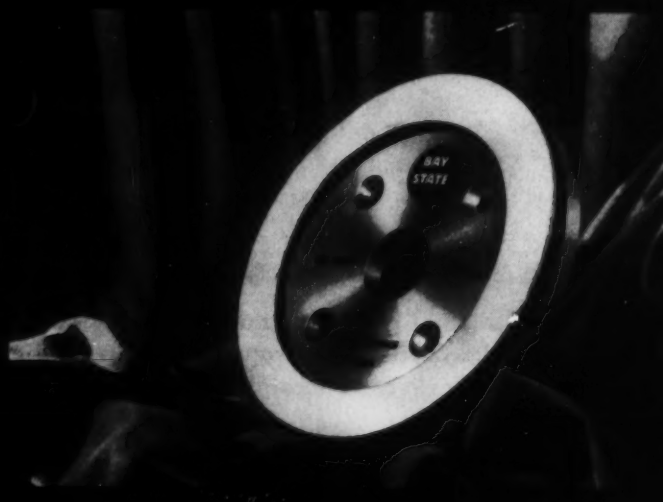
Bay State Diamond Wheels



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18-8 Cylinder Liners

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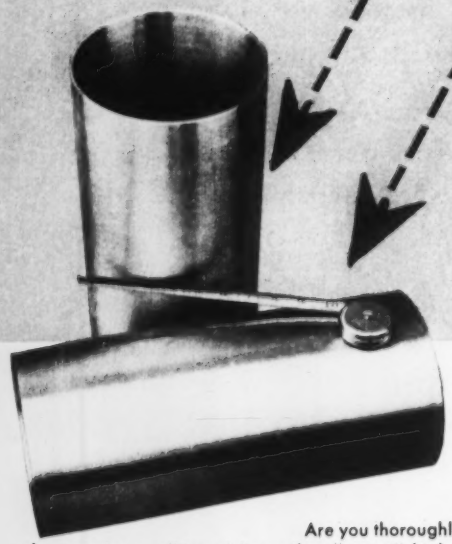
• True wall thicknesses

Tough, close-grain metal



Are you thoroughly familiar with the superior qualities of "centrifugally cast" high alloys . . . such as these cylinder liners, for example?

Centrifugally cast metal is exceptionally uniform, close-grained and strong. It is free of pits and pockets. It is capable of passing very rigid tests. And the practical advantage is that as long as there is a central circular hole, almost any outside shape can be cast. Some of our customers want their castings centrifugal even though considerable boring and other machining is necessary to finish the piece.

We recommend our centrifugal casting service if your requirements call for the characteristics outlined above. Our high alloy foundry is modern in every respect and staffed by metallurgists and foundrymen of many years' experience with both centrifugal and static castings.

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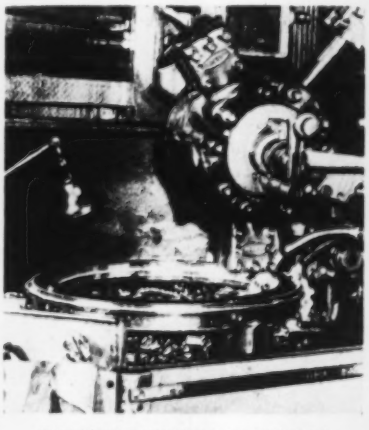
Job Gets Carbide Swap

SWITCH of carbide cutting tools on a jet engine job cut downtime by two thirds, increased tool life 300 per cent and reduced tool breakage.

Operation at the Lynn River Works of General Electric Co. consists of turning and boring both inside and outside diameters, and then facing rims of jet engine turbine wheels. It required a new carbide tool every time an outside or inside diameter was completed.

This resulted in frequent tool changes and new setups. Furthermore, some 30 to 40 tools hit the scrap heap due to breakage. Even in boring, the attrition rate of the previously used carbide tool was high, since it lasted through only one cut.

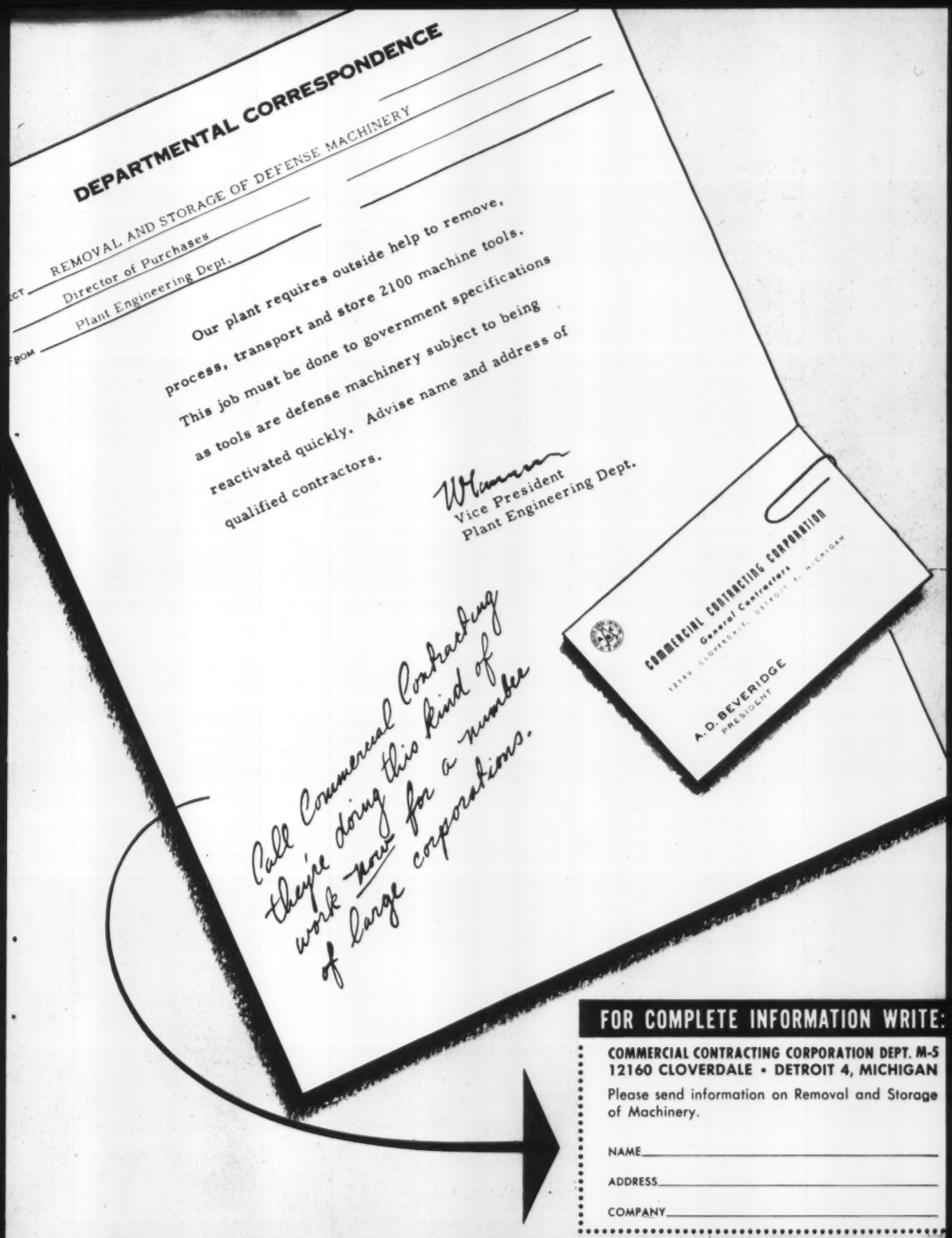


CARBIDE TACKLES JET WHEEL
. . . cuts downtime by two thirds

Boost — Part is cold-worked, forged Timken steel with Brinell readings ranging between 269 and 321. In spite of this hardness and toughness, carbide grade now in use, Carboloy 370, produces three inside and outside diameter cuts before being ready for regrinding.

In a week's time, only one tool was broken, and this was due to weak brazing.

Tool Shape—Cutting tools are provided with a 15-degree lead angle, ⅛-inch radius and a chip breaker. Depth of cut varies from ½ to ⅞-inch, feed is 0.010-inch and speed is about 160 fpm on the outside diameter. Both cutting areas are flooded with a water-soluble coolant.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LOWER COSTS

SPEED — Rate at which the work is performed. HARRISON Abrasives provide fast work, with effective abrading action.

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6020 **SUBSIDIARY OF AMERICAN-MARIETTA COMPANY**

New Motor, New Grinder

Design incorporates new, smaller NEMA motors on belt grinders. Customer is happy

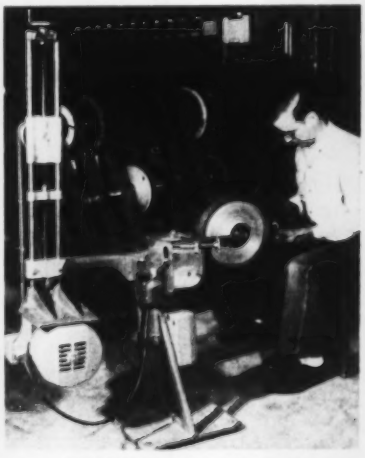
ONE of the first applications for an electric motor in the size range of the recent NEMA rerating of standards is reported by Stephen Bader & Co., Rockville Center, N. Y. Their new single-based polisher has been designed to accommodate a 2-hp, 3600-rpm, 3-phase motor directly on the balanced base.

Called the Space Saver, the new Bader machine mounts all operating components on a balanced base, making it easier for operator to change working heights from sitting to standing position. By loosening one bolt, he can swing the unit to desired position. Tracking and belt tension remain unaffected.

Motor Vital—Grinder is driven, in this case, by a GE Tri-Clad 55 totally-enclosed fan-cooled motor. Under the new standards, it is smaller and lighter than former models of the same horsepower.

Company engineers report that the new motors have showed improved operating characteristics and require very little maintenance. A completely sealed cast-iron housing helps protect the motor from metallic and abrasive dusts.

Differing from the conventional backstand grinding machine, the Bader unit uses the drive pulley as the backstand, with the frontstand idler pulley performing as the contact wheel.



SPACE SAVING GRINDER
. . . with space saving motor

Sure we sell Specials...

PURTHER INFORMATION ON THIS SPECIAL MACHINE WILL BE SENT AT YOUR REQUEST

but only if you need them!

As every industrial buyer knows, there are, broadly speaking, two different classes of fasteners.

The first, and most widely used, are the "Standards". These include most of the common bolts and nuts.

The second class are the special purpose fasteners—or "Specials". As the name implies, these fasteners have features to meet special requirements.

Generally speaking, "Specials" are more expensive than "Standards" because they are more complicated to make and are not produced in as large quantities.

As a full line manufacturer, Lamson & Sessions makes both types.

Naturally there are many applications where, because of the nature of the fastening problem, "Specials" are required. However, in some instances, Lamson has been able to suggest the successful substitution of a "Standard" for a more expensive "Special".

All of which boils down to this: Lamson & Sessions is interested in what is best for the customer from a *value* as well as a *cost* standpoint.

That's another reason why its pleasant and profitable to do business with Lamson & Sessions.

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FOR PROMPT DELIVERY AND HELPFUL SERVICE, ORDER FROM YOUR LAMSON DISTRIBUTOR

MACHINE SCREWS
Precision made for fast, economical assembly.

PLUG NUTS
Ideal for blind or hard-to-reach places.

TAPPING SCREWS
Choice of round, pan, truss, flat oval, hexagon and Phillips heads.

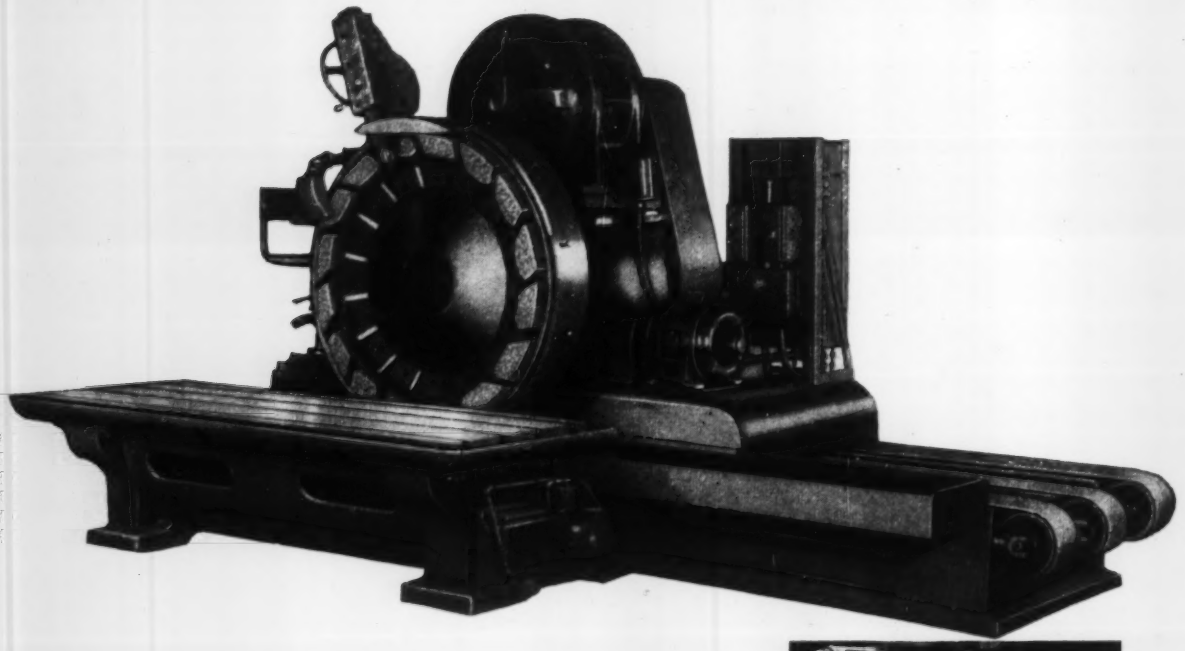
CAP SCREWS
"1035" Hi-Tensile Heat-treated steel.

SQUARE AND HEX MACHINE SCREW NUTS
Also semi-finished, hot pressed and cold punched nuts.

LOCK NUTS
Economical, vibration proof. Can be used repeatedly.

COTTER PINS
Steel, brass, aluminum and stainless steel.

"1035" SET SCREWS
Cup point type, hardened and heat-treated.



MATTISON TRAVELING WHEEL GRINDER FOR FAST FINISHING OF LONG OR LARGE PARTS

If your work consists of long or bulky parts, Mattison UK Traveling Wheel Grinders will finish them at a surprising rate of speed and accuracy and at very low cost. Large and awkward shaped pieces are frequently ground in a good deal less time than previous method. The part, no matter how large, is clamped in a stationary position and the grinding wheel passes across the surface to be finished. Amount of floor space needed is little more than half that required by traveling table machines of equal capacity. The operator's position on the carriage, together with the convenient grouping of all controls, makes for utmost grinding accuracy and speed regardless of the size of the job.

For further information, send for new free circular No. 844-2 RM covering this machine.

The operator rides the carriage of the UK Traveling Wheel Grinder. From this position he gets a safe unobstructed view of the grinding wheel at point of contact and can observe the work at all times.

Heavy work of practically any length can be rapidly ground to close tolerances with no more power required than for lighter work — the UK's table is always stationary. Picture shows end of 35′ base being ground.

MATTISON MACHINE WORKS

ROCKFORD · ILLINOIS

Mechanized Delivery

Using an Automatic Transporter, one man services a battery of punch presses at Crown Cork & Seal Co.'s main plant in Baltimore. The mechanized equipment replaced a manual lift jack to feed the 2400-pound loads of tin plate. Seven other Transporters replaced manual equipment in departments throughout Crown Cork plant

Automatic Hydraulic Grinder

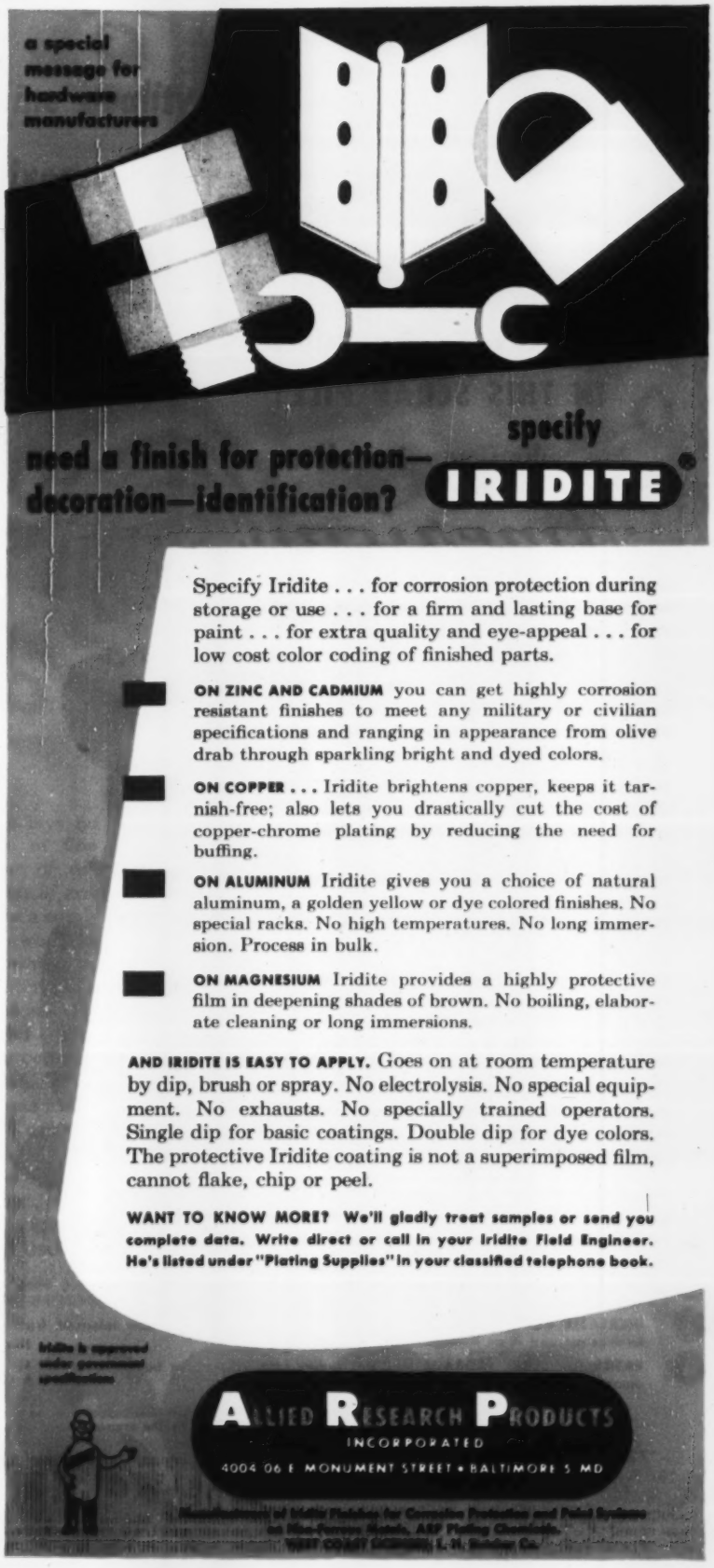
Jadco Inc., Cleveland, has patented an automatic hydraulic machine capable of grinding, polishing, surface grinding and profile grinding. Although holding patent rights, the firm will not produce the grinder itself and is seeking another company to take over manufacturing and marketing functions.

In above operations, machine's headstock speeds can be set from 78 to 1360 rpm; speeds can be set up to fit product by changing diameter. Head swing is 9 inches and longitudinal stroke is a minimum ½ inch to maximum 8 inches.

Longitudinal stroke speed can be slowed from 0 to 80 strokes per minute by adjusting flow control valve.

Machine Tool Control Sessions

Plans for a two week special summer program on the Automatic Control of Machine Tools, to be held from August 23 to September 3, have been announced by Massachusetts Institute of Technology.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Specify Iridite . . . for corrosion protection during storage or use . . . for a firm and lasting base for paint . . . for extra quality and eye-appeal . . . for low cost color coding of finished parts.
ON ZINC AND CADMIUM you can get highly corrosion resistant finishes to meet any military or civilian specifications and ranging in appearance from olive drab through sparkling bright and dyed colors.
ON COPPER . . . Iridite brightens copper, keeps it tarnish-free; also lets you drastically cut the cost of copper-chrome plating by reducing the need for buffing.
ON ALUMINUM Iridite gives you a choice of natural aluminum, a golden yellow or dye colored finishes. No special racks. No high temperatures. No long immersion. Process in bulk.
ON MAGNESIUM Iridite provides a highly protective film in deepening shades of brown. No boiling, elaborate cleaning or long immersions.
AND IRIDITE IS EASY TO APPLY. Goes on at room temperature by dip, brush or spray. No electrolysis. No special equipment. No exhausts. No specially trained operators. Single dip for basic coatings. Double dip for dye colors. The protective Iridite coating is not a superimposed film, cannot flake, chip or peel.
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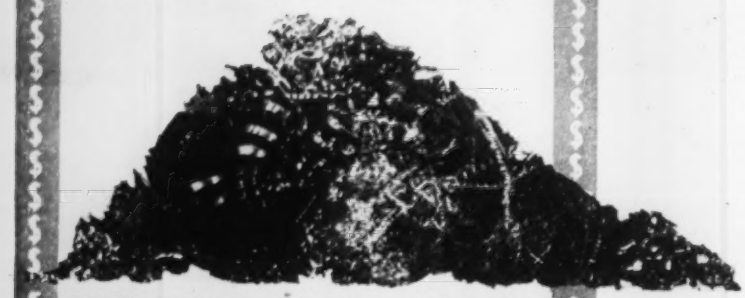


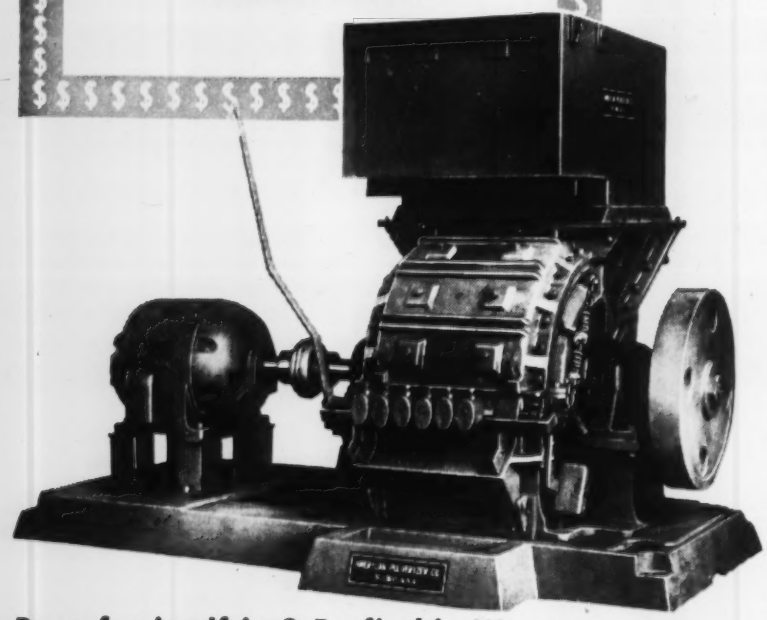
THERE ARE EXTRA DOLLARS IN THIS SCRAP PILE!

...when you install an

American

METAL TURNINGS

CRUSHER



Pays for itself in 3 Profitable Ways:

1. **TOP SCRAP VALUE.** Uniform short shoveling turnings produced by an American bring up to $4 per ton more than regular machine shop turnings.
2. **INCREASED CUTTING OIL RECOVERY.** Up to 50 gallons per ton are released from turnings reduced in an American.
3. **EASIER HANDLING, STORAGE.** American-reduced turnings require but a fraction of the usual storage space . . are easily briquetted.

Available in 1 to 10 tons per hour capacities to meet your needs. WRITE today for the complete American profit story.

American

PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1539 MACKLIND AVE. • ST. LOUIS 10, MO.

Oil Spray Controls Waste

USE OF OIL SPRAY to further improve the control of airborne wastes at an industrial plant has been achieved by co-operative action of the Disco Co., a division of Pittsburgh Consolidation Coal Co. and Gulf Oil Corp.'s laboratories.

Results obtained indicated opportunities for preventing industrial smoke and dust, according to the laboratories. Further studies of industrial applications are contemplated.

Previous Controls—Previously Disco has spent about $250,000 to control its handling, heating and crushing of coal and carbonized coal particles, in order to avoid objectionable quantities of dust and smoke. The results, though adequate, fell below the company objectives in cleanliness.

Results of New Method—Now after four months of test operations oil spray has nearly perfected the pollution control picture and resulted in a new high degree of cleanliness for an operation of this type.

Disco makes a coked pellet which is marketed on the basis of its excellent heating and clean burning qualities. In the process, crushed Disco (called fines) recovered from screening of the finished product is mixed with crushed coal, heated in roasters and kilns for low temperature carbonization and then reduced to maximum six-inch diameter size by crushing.

Tests Run With Oil — Next a series of tests was run at the plant, using a special oil provided by the laboratories. It was disseminated through a Gulf-developed nozzle designed to produce an unusually fine spray. Results proved decisive. When the oil hit the mixing point of the fines and crushed coal only a white vapor was given off. When the sprayed raw material was fed to the roasters, the only resulting discharges from the stacks were thin white plumes.

The oil apparently functions by coating the powdered fines and coal so that all dust is held on the surface and carbonized with the product. A certain amount of product is saved in this manner.

For fine quality and fast delivery specify Jessop corrosion and heat-resisting steels

Jessop lays no claim to being the only good source of fine stainless steels. *There are a number of very reputable concerns producing products of excellent quality.* But we believe we possess a combination of virtues which make it highly worthwhile to specify Jessop when ordering stainless bars, sheets, plates or *rolled angles* — a recent addition to our line.

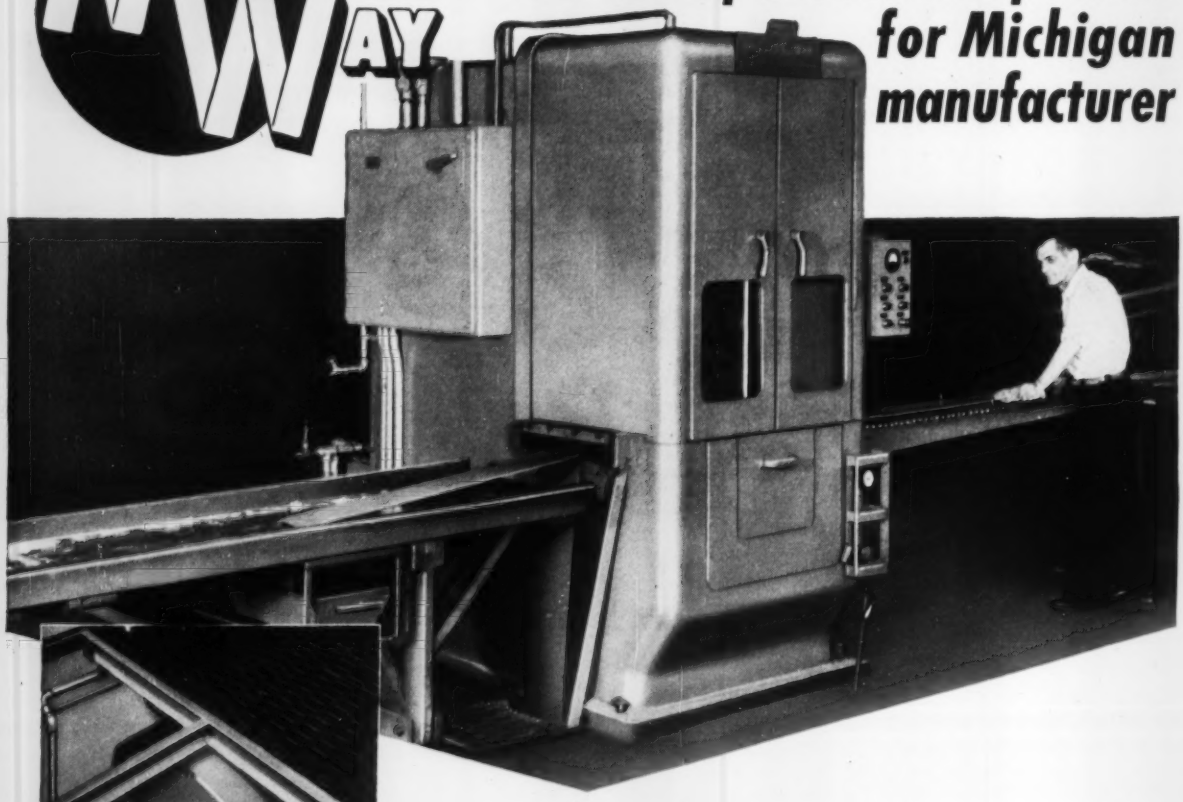
First of all, our stainless unit is moderate in size, yet all operations through melting, rolling and processing are carried out by us at one location. This affords an opportunity to offer the same individual attention and fast delivery on any order, large or small. Second, we'll take a back seat to no one when it comes to quality control and finish. It's a matter of pride with us. And last, but not least, you'll be dealing with a young, aggressive organization which understands that *the best way to keep growing in these days of tighter competition is to build repeat orders through satisfied customers.* Send us an inquiry.

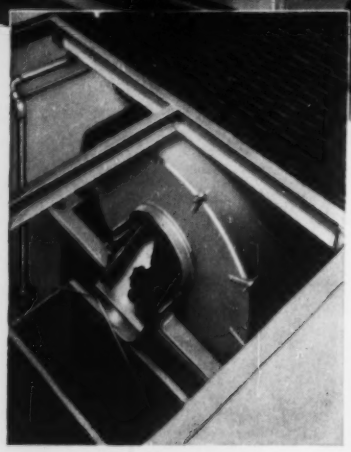
JESSOP

STEEL COMPANY · WASHINGTON, PENNSYLVANIA

MURRAY WAY

MICRO-POLISH strip grinding boosts output over 600 percent for Michigan manufacturer





The New Murray-Way rotary filter which efficiently reclaims coolant on this operation. Permanent filtering media saves the cost of this equipment in a short time.

- ★ **Assures Product Uniformity**
- ★ **Cuts Material Loss and Scrap**
- ★ **Eliminates Down-time**
- ★ **Replaces Two Expensive Hand Operations**
- ★ **Facilitates Subsequent Operations**
- ★ **Improves Product Appearance**
- ★ **Eliminates Dust and Mess**
- ★ **Pays For Itself**

Here's one more illustration of Murray-Way's ability to do the job better, faster, and more economically.

Murray-Way's Automatic Equipment, thorough experience and expert engineering can save YOU money on YOUR polishing, buffing, grinding or filtering operations. Why not give us a call . . . JOrdan 4-6890 Detroit, or write for our complete, illustrated Micro-Polish Brochure.

MURRAY WAY

MURRAY-WAY CORPORATION

P. O. BOX 180, MAPLE ROAD EAST · BIRMINGHAM, MICH.

Polishing, Buffing, Grinding, Filtering Equipment that automatically cuts your costs.

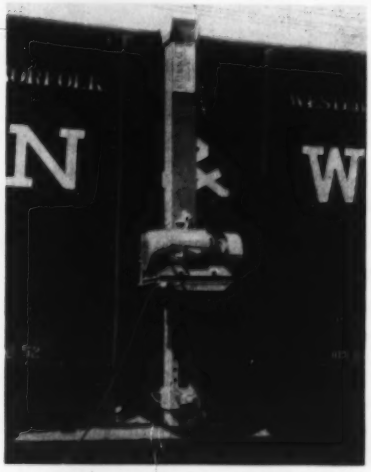
Bulk Unloading

Car unloading leaves pick and crowbar technique. A shaker speeds the job, adds safety

ALWAYS tedious, sometimes hazardous when it was a manual job, unloading of various bulk materials is now a mechanized operation for many firms. A good example is work done at Parker Appliance Co., Cleveland, where a portable car shaker has proved its merit over almost a year's use.

Installed in Parker's receiving yard on a powerhouse rail spur, the shaker is driven by a 5-hp, 1750-rpm, ac motor built by Reliance Electric & Engineering Co. Serving as a mount is a jib crane with 9-foot swinging boom, 1-ton high-speed chain hoist and 1-ton ball bearing trolley.

Positioning — To unload, the shaker is swung by the crane into position on the car and clamped to its side. One end of the steel bar clamp is hooked onto car's underframe; the other is fastened on with a heavy adjustable-tension screw on the shaker, which tightens the unit against car's side.



UNLOADING BY PUSHBUTTON
. . . time-saving is 62½ per cent

Time required to unload depends primarily on the speed at which the emptied contents can be removed into storage or to point of use. In conveyorized installation, conveyor speed determines speed of unloading, because the shaker is capable of keeping material handling equipment operating at full capacity. In instances where material is dropped into a large pit or from a trestle, coal cars have been unloaded in 4 to 10 minutes.

Results — At Parker, two men formerly were required to unload a car—and the job took 8 hours, often more. Also, a workman had to be on his toes to avoid losing his balance when the load shifted during unloading.

One man works the shaker and does it with a saving of about 62½ per cent per car compared with time required previously.

Electronic Test Standard Set

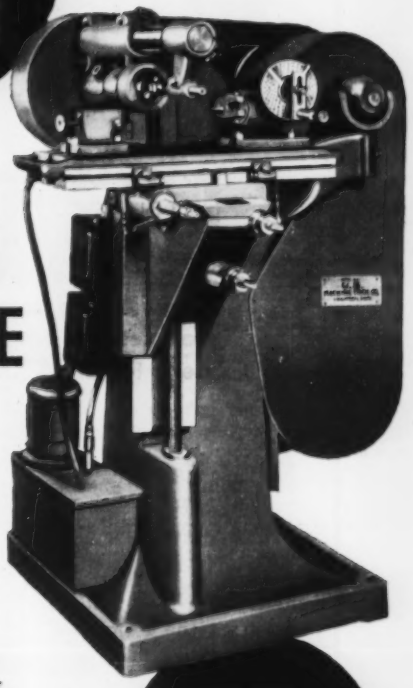
An international standard for testing electronic parts used in radio communcation and electronic apparatus—a major advance toward world standardization—has been published by International Electrotechnical Commission.

American Standards Association announces U.S. approval of the standard, whose purpose it is to meet a need for a common international language in testing and rating electronic components.

"U.S." No.1

CAN DO AS MUCH AND DO IT AS WELL AS MILLING MACHINES THAT COST UP TO TEN TIMES MORE!

HORIZONTAL MILLING MACHINE

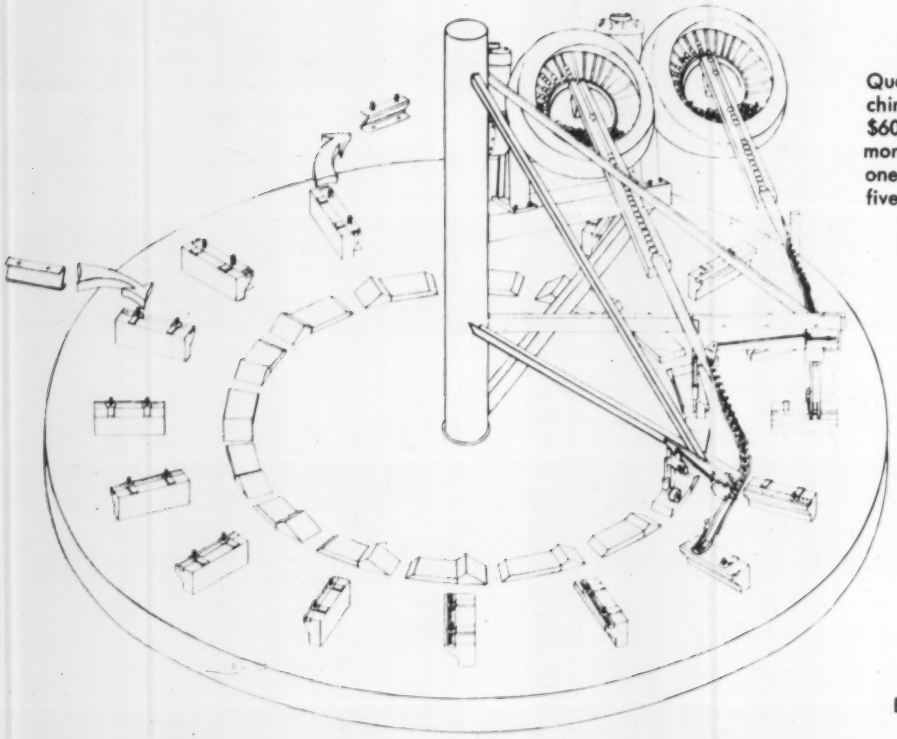


RUGGED
SIMPLE
ACCURATE
ECONOMICAL

The U. S. No. 1 has long been the nation's number one favorite heavy-duty hand milling machine. Its unusual capacity and simplicity make it adaptable to a wide scope of high speed production operations with air-hydraulic feeds.

Send for complete data on specifications accessories and production applications.

THE U. S. BURKE MACHINE TOOL DIV.
Brotherton Road 14, Cincinnati 27, Ohio



Quotations on bolt setting machines ranged from $4000 to $6000 each with four to five-month delivery. Two like the one at the left were built in five weeks at a cost of $5000

By FRANK M. BUTRICK JR.
Alma, Mich.

TWO WAYS . . .

To Trim Fabrication Costs

By switching from stamped to rolled parts and mechanizing bolt setting, small firm making automotive stampings expects to save $8000 on one job during next 8 months

FORMING and assembly shortcuts are expected to save $8000 in 8 months on one job at a small Michigan firm that makes small automotive stampings.

The stamping is a Z-shaped, structural member, with four weld bolts projecting from the flanges —two on each side. When the job was prepared for quotation, plans called for three press operations: Pierce and blank (automatic), first form and restrike. Welding was the next step. Production was to be 8000 pieces a day.

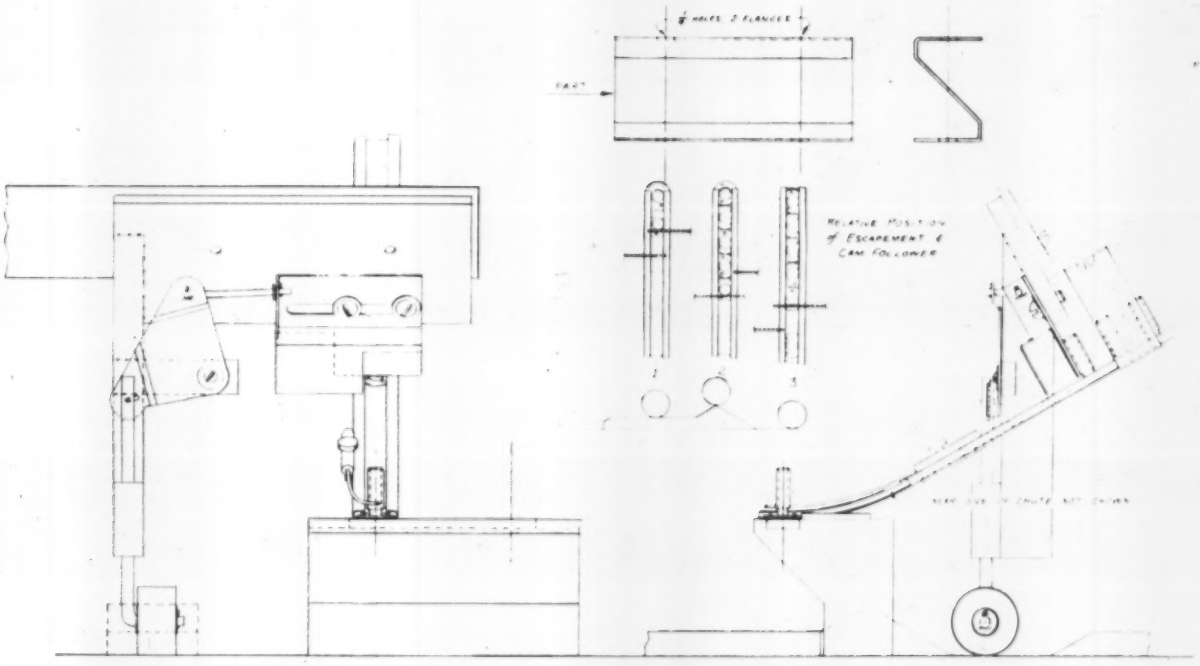
Help Here—In view of production wanted, an outside engineering firm suggested opening tolerances for over-all length and for the relation of holes to the ends of the piece. With this setup, they advised, the part could be pierced on an automatic, coil-feed press. After recoiling, the form could be produced on a Yoder mill that had some open time.

Part was quoted as a rolled piece rather than a stamping. Stamping required the services of three men: One to operate the coil-feed press occasionally and two on the forming and restrike operations. To roll parts, the coil-feed press was placed near the Yoder mill, and one operator tended both. The net gain was 20 man-hours a day.

Of course, the pierce die and Yoder mills need constant attention. If the die wears and produces a burr, it will score rolls badly. But the die was designed with this eventuality in mind, and preventative maintenance has eliminated work stoppage.

Bottleneck—Second part of the savings came when production began. The cost department calculated rates for the piercing and rolling, the tedious job of setting bolts by hand and welding. It was found that the 8000 pieces a day could be pierced and rolled in about 1½ hours, bolt setting took 30 to 40 hours and welding 16 hours.

Welding was handled by two machines, with electrodes engineered for the job. The lower electrode supported the head of the weld bolt and was machined to clear the sloping center section of the work. Bolt spacing



Escapement device releases a bolt just before the fixture is under the end of bolt track. Wire causes bolt to slide across surface of alnico magnet

was maintained by the upper electrodes. They were tubular and insulated with a sleeve of nylon (0.007 inch thick) to protect threads on the bolts.

The "air" in the part was bolt setting. Management decided immediately to mechanize this operation, but owing to the isolated location of the plant, valuable time was lost getting even "thumb nail" quotations from distant sales offices. Quotations averaged from $4000 to $6000 a unit (two were required); delivery time was set at from 4 to 5 months. So these plans could not be followed.

Dilemma—The job was to last only until the fall of 1954; and the equipment, as quoted, bit deeply into possible savings. More importantly, estimated delivery dates would have left only 3 to 4 months for production.

The problem was dropped into the lap of a local tool firm. They designed and built the two units in 5 weeks for $5000.

Requirements—The machine has a rigid central column, upon which are mounted the hopper-feed units with their tracks and escapements; a round table contains work fixtures and cams to operate the feed escapements.

The rotary table is driven by a variable speed motor, adjusted to deliver 1000 parts each hour to the welder. At this speed, one girl can drop the parts over the bolts as they come past.

Knottiest problem was devising a way to hold the two bolts. With upset heads, they are irregular in size and shape, but they must be held the proper distance apart and with enough rigidity so a girl can drop the sheet metal component over them every 3.5 seconds. Bolts also must be released so the welder can pick them up.

Solution was found by making the fixture blocks from bronze and setting alnico magnets into them.

How It Works—The escapement device, actuated by cams on the table, releases a bolt just before the fixture is under the end of the bolt track. The bolt slides down to the end of the track, where it is held by a piece of spring wire. As the fixture comes by, the wire causes the bolt to slide across the surface of the magnet, until a small block on the fixture contacts the bolt head and forces it out of the track and past the spring.

The girl operator then drops the sheet metal component over the bolts, and the welder slides the part off the fixture as it comes to him by grasping the bolts. Should he miss one of the parts, a safety switch, triggered by a rod positioned to be tripped by a bolt remaining on a fixture, prevents damage to the bolt tracks.

Plan of Action—The two machines were built in 5 weeks. Engineering took about two days. Work on the tables, columns and fixtures started at once. A hasty search of Midwest dealers of used machinery uncovered four hopper-feed, screw-drivers that were purchased for $500 each. The bowl feeds only were used, and new collector rings were ordered immediately.

By the time collector rings arrived, the machines were built; the fixtures and cams were located on the rotary table; the hopper feeds were overhauled and installed; and tracks and escapements were built and motors installed.

The story is an example of how small-plant management, if it looks ahead, can make quick, sound decisions when they count the most in a period of sharp competition.

THE INDUSTRIES' Best KNOWN TRADEMARK!

MACDERMID INCORPORATED
Chemicals For Stripping

METEX STRIP AID for Stripping and Refinishing Plated Deposits . . .

- Chemically removes nickel and copper from steel base metals.
- Does not attack the base metal being stripped.
- Eliminates the need for repolishing.
- Reduces costs and former stripping hazards.

Write for Data Sheet #30.

METEX DB STRIP for Stripping Plate From Die-Castings . . .

- Removes chrome, nickel and copper in one electrolytic operation.
- Eliminates former operation of repolishing and rebuffing diecastings.

Write for Data Sheet #20.

METEX ZINC STRIP for Stripping Zinc Plate . . .

- Improved alkaline strip that is fast and economical.
- Will not attack steel base metals.

Write for Data Sheet #10.

Other STRIPPING AIDS

Write today for full information on MacDermid Incorporated Strip Aids that are available for tin, chromium, lead, lead-tin, phosphating, anodizing, paint stripping and carbon removal . . .Tell us your stripping problems and we will be pleased to give you the results of our 32 years experience and service to the metal finishing industry.

WRITE FOR FREE DATA SHEETS

OVER 32 YEARS SERVICE TO THE METAL FINISHING INDUSTRY!

MAC DERMID
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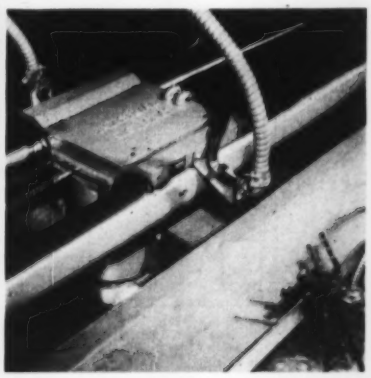
Manufacturing Facilities also at
MICHIGAN • OHIO • ILLINOIS • CALIFORNIA

Atom in Steelmaking

THE ATOM is a steelworker! It's been one since a fission product of uranium was used in a new gage that continuously measures the thickness of metallic coatings on a rapidly moving steel strip. Improved quality control and increased efficiency in coating operations are made possible utilizing



Gaging head ranges back and forth across width of zinc-coated strip

the gage, which also creates the opportunity for automatic control of the coating process.

The Accuray reflection gage is the result of a three-year joint research program by Armco Steel Corp. and Industrial Nucleonics Corp., Columbus, O. Initial application of the gage, in Armco's continuous zinc-coating process, is to instantaneously determine weight of coating only minutes after steel strip leaves the zinc pot.

How It Works—Heart of the new gage is a radioactive element which emits beta rays. A radiation detector picks up the rays reflected by the coated steel. These impulses are translated in an electronic unit into inked lines on a recording chart. Lines indicate thickness of coating in standard units.

Gaging head automatically ranges across the width of the strip and gives the coating weight on the entire length of steel strip. Armco uses two gages to measure coating on both sides of the strip. It detects even minor variations in coating weight and compensates for changes in humidity, temperature and dust content of the air.

NEW PRODUCTS and equipment

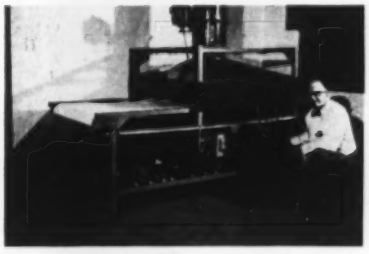
Reply card on page 147 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Drying Tunnel Kits

. . . for screen process drying

Air-flow drying tunnel kits offer quick, low-cost assembly of far-infrared tunnels for improved screen process drying. They also offer far-infrared advantages of rapid, controlled drying and saving of floor space.

Two models are available to fit most frequent production needs.



With each, belt speeds from 5.6 to 23.4 fpm can be obtained and intensity of the all-metal heaters can be varied from 4 to 100 per cent of their capacity. Each kit provides components required to construct a tunnel with 36-inch-wide belt. Edwin L. Wiegand Co.

FOR MORE DATA CIRCLE NO. 1 ON REPLY CARD

Fiber Drum

. . . dispenses wire quickly

The Payoffpak system of handling many types of wire is a labor saver.

As wire comes off the drawing machine, it goes around a revolving capstan, passes through an eyelet or feed pipe and is laid loose into the rotating fiber drum. When the drum is full, the "hat" is lowered, the cover lever-locked on and the Payoffpak is ready for shipping.

To dispense wire for drawing or fabrication, an operator pulls the loose end of the wire from the top of the drum, threads his machine and the wire is ready for

use. The Payoffpak accommodates up to 500 and 600 pounds of continuous, ready - to - use lengths. Continental Can Co.

FOR MORE DATA CIRCLE NO. 2 ON REPLY CARD

Liquid Floor Etch

. . . for better paint adhesion

To provide better adhesion between paint and old or new concrete floors, a liquid floor etch is announced by Tropical Paint & Oil.

Etch is applied after thorough cleaning. A stiff broom spreads it easily over the entire area. In 15 to 30 minutes etching action is complete. Area is then flushed with clean water and swept or mopped. After drying, floor is ready for paint. Tropical Paint & Oil Co.

FOR MORE DATA CIRCLE NO. 3 ON REPLY CARD

Battery Charger Line

. . . from 10 to 42 cells

Lincoln announces production of a line of battery chargers which it is adding to its product line.

Three models are available to cover charging requirements for batteries of 10 to 42 cells. Model S9640 is designed for batteries of 10 to 15 cells used with the walkie-type truck. Model S6088 is for 10 to 30-cell batteries for heavy-duty trucks of the walkie and

rider type. Model S9607 charges Nickel-Iron-Alkaline batteries with 21 to 42 cells. Lincoln Electric Co.

FOR MORE DATA CIRCLE NO. 4 ON REPLY CARD

Storage Battery

. . . more power per size

A storage battery supplying more capacity relative to its size than any previous Edison Nickel-Iron-Alkaline storage battery is announced by the Edison Storage Battery Division.

Designated as the MC-type, it affords a means of supplying most electric trucks with as much as 25 per cent more capacity without changing either steering wheel or pedal heights and without increasing either length or width of battery boxes. Cells of the MC-type battery employ standard steel-type and pocket construction. Standard assemblies range from 10-cell MC4,

NORTHERN

MAGNET HANDLING, ELECTRIC OVERHEAD TRAVELING CRANES

Higher Speed You can handle more turnover in a given space, or a fixed turnover in less space, with a Northern Electric Overhead Traveling Crane. Desired higher operating speeds are available through various combinations of bridge, trolley, and hoist travel speeds.

Dependability You can make most advantageous use of yard space without fear of crane breakdowns. Yard cranes are purposely built and equipped for rugged, 24-hour continuous service. They have only the heaviest duty type bearings, gears, end trucks, highest quality motors, controls, and other electrical equipment.

Visibility Safer, better, faster load handling and stacking is possible because the operator has better visibility from the Northern Clear Vision Control Cab.

Low Cost Operation Northern Magnet Handling, Electric Overhead Traveling Cranes cost less to operate—have oil bath lubrication which eliminates necessity for daily lubrication and crane idle time—have fewer parts to wear out, fail, or replace.

When you investigate, ask for Bulletin No. 141-C.

NORTHERN ENGINEERING WORKS
210 CHENE ST.
DETROIT 7, MICHIGAN

NEW PRODUCTS and equipment

rated capacity 3.42 kwhr, to 42-cell MC10, rated capacity 35.78 kwhr. Thomas A. Edison Inc.

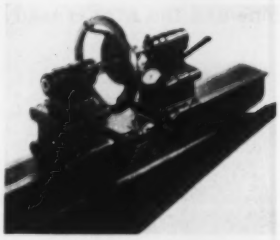
FOR MORE DATA CIRCLE NO. 5 ON REPLY CARD

Bench Centers

. . . streamlined, modernized

Changes in design and improvements have been made on the Brown & Sharpe bench centers.

The bench has been streamlined and modernized. Of U cross-section, it is heavily ribbed with a three-point bearing. Headstock



and footstock are adjustable individually and can be locked in any positon. They are furnished with or without dial test indicators.

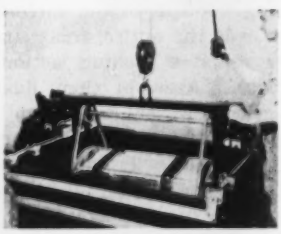
Headstock and footstock of the centers swing 8 inches in diameter and take work 36 inches in length. Raising blocks can be furnished which increase the capacity of the centers to work 16 inches in diameter. Brown & Sharpe Mfg. Co.

FOR MORE DATA CIRCLE NO. 6 ON REPLY CARD

Plating Barrel

. . . drive eliminates gears

Plating barrel design offers industry a high rate of plating production with savings of up to 100



per cent in maintenance manhours.

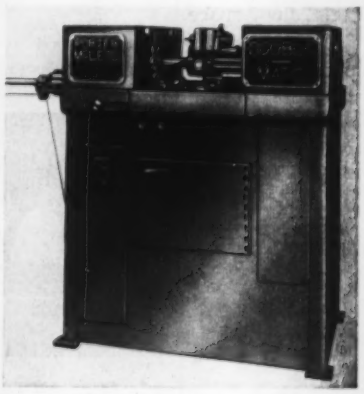
A dual v-belt suspension drive eliminates transmission gears and cylinder bearings, which are subject to wear and corrosive damage. Cylinder is suspended in the tank from the superstructure by two equal-length v-belts running from drive shaft pulleys to grooved circumferences at both ends of the cylinder. Cathode contact is made by a self-cleaning, inverted v-block 12 inches long on each end of the superstructure. As the superstructure is lowered, guide channel directs it automatically into proper operating position. G. S. Equipment Co.

FOR MORE DATA CIRCLE NO. 7 ON REPLY CARD

Screw Machine

. . . one cycle works two sides

Screw machine which machines both front and back of workpieces



in one complete cycle is announced by Porter-McLeod.

Double-Matic utilizes a tool-holding turret revolving on an axis parallel to the spindle. Stock is fed through, clamped and machined on the front side. Final turret position is occupied by a live spindle that contains a collet and runs at same speed as main drive spindle. This live spindle grips the workpiece, supports it during cut-off and continues to hold it. While turret tools machine next piece, back end is machined by tools mounted on headstock. Porter-McLeod Machine Tool Co. Inc.

FOR MORE DATA CIRCLE NO. 8 ON REPLY CARD

Air Balance System

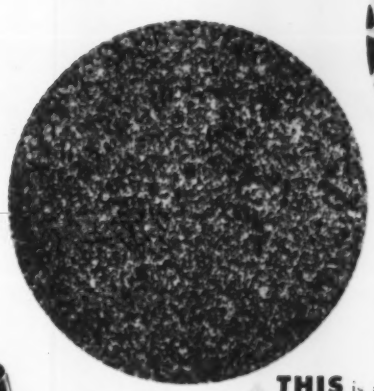
. . . eliminates counterweight

To eliminate expensive counterweight assemblies on vertical machines Buhr introduces an air bal-

You don't need 3-D glasses

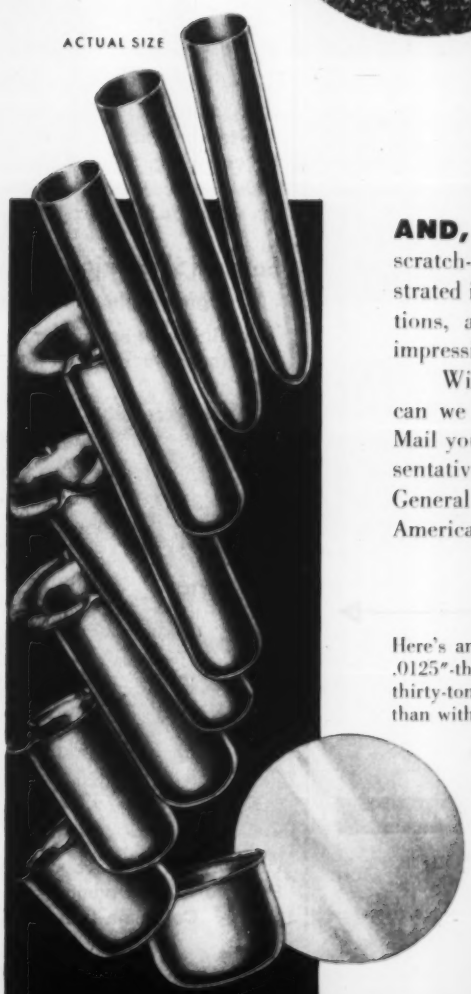
to see the difference

THIS is a 75X magnification of ordinary drawing brass—the kind that's been used for decades for stamped or drawn brass products.



THIS is a 75X magnification of super-fine-grain Formbrite.* Isn't it obvious that this new type of brass can be polished in half the time? Frequently, a simple color buff will bring up the desired finish for lacquering or plating.

ACTUAL SIZE



AND, Formbrite is harder, stronger, springier and more scratch-resistant than ordinary drawing brass, yet has demonstrated its remarkable ductility for forming and drawing operations, and ability to take sharp, clean-cut ornamental die impressions.

With all these advantages, Formbrite costs no more. What can we do to help you try this time and cost-saving metal? Mail you a booklet? Send you a sample? Ask our Sales Representative to call? Simply write to The American Brass Company, General Offices: Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario, Canada.

*Reg. U. S. Pat. Off. 5486

Here's an example of Formbrite at work. These pen caps are made of .0125"-thick Red Brass Formbrite strip at the rate of 2,000 an hour on a thirty-ton, 10-step multiple plunger press. Caps are buffed at a higher rate than with any other metal previously used.

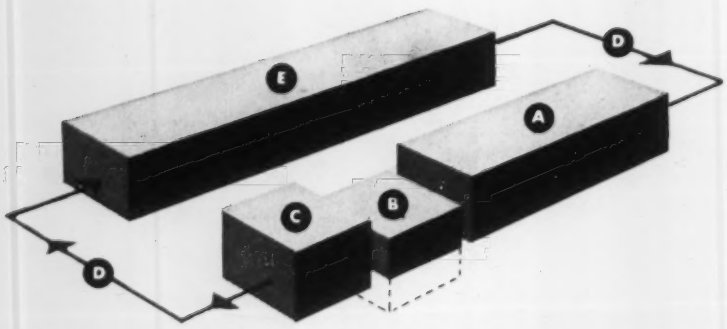
DRAWING BRASS

an **ANACONDA®** Product

made by The American Brass Company

Heat Treat Furnace Layout

by *Holcroft* . . . 7th of a Series



A SOLUTION FURNACE (8 HRS. @ 940°F.)
B HOT WATER QUENCH
C BLAST QUENCH
D AUTOMATIC TRANSFER
E PRECIPITATION FURNACE (13 HRS. @ 460°F.)
F TRAY TRANSFER

Controlled Heat Treating of Forged Aluminum Parts

A battery of five installations like the one above—each over 100 feet long—treats 11300 pounds of aluminum forgings every hour in a government project in the midwest.

Parts go through a solution furnace and then are either quenched in hot water or blast cooled with air. Forgings are automatically transferred to a precipitation furnace where they are age hardened. Temperatures are held within plus or minus 5°F.

Tough job? Not particularly! All Holcroft installations, from the smallest to the largest, can be designed around automation—the elimination of the human element. On top of that, when necessary, furnaces can tie right into the production line.

It doesn't take long for installations like these to pay off in a BIG way! Holcroft & Company, 6545 Epworth Blvd., Detroit 10, Michigan.

BUILT BY HOLCROFT & COMPANY DETROIT, MICH. — PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

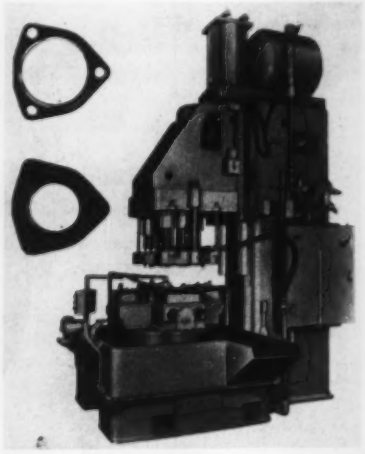
CHICAGO, ILL. • CLEVELAND, OHIO • HOUSTON, TEXAS • PHILADELPHIA, PA.

CANADA
Walker Metal Products, Ltd.
Windsor, Ontario

EUROPE
S. O. F. I. M.
Paris 8, France

ance system. System operates at 50-pound line pressure and storage tank cuts air consumption to a minimum. It is fully equipped with a safety device to guard against air failure or creepage during idleness.

This machine bores, drills and chamfers two automotive steel



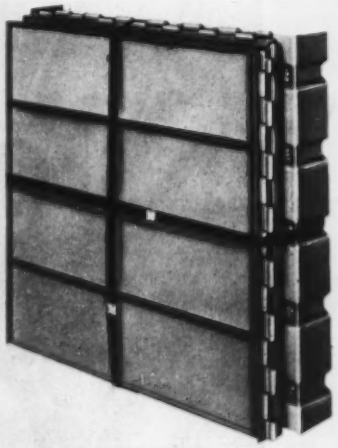
flanges at a time, at a rate of 329 pieces per hour gross. Holding fixture, mounted on an automatic index table, is arranged with hydraulic clamping. Buhr Machine Tool Co.

FOR MORE DATA CIRCLE NO. 9 ON REPLY CARD

Box and Skid Unit

. . . *lightweight, collapsible*

A lightweight, collapsible steel box and skid unit for shipping is



the newest product of Republic's Pressed Steel Division.

The Collaps-a-tainer combines

"I'll come to the point— how about the order?"

"THAT'S right, Mr. Brown! I'd like that order. And I'd like to tell you more about our special equipment and facilities. When you give us an opportunity to see the plant like this, we can point out other ways to help you cut costs."

"That's what we're looking for, Jim."

"Well, over there's a perfect spot for Wolverine Trufin*. That's our integral finned tube, you know. That feature alone is important because—as the fins are part of the tube—Trufin will stand up under the shock of extreme vibration, temperature changes, or high pressures. Yes, and it will give you increased surface area—let you design a smaller shell—a lighter, more compact unit."

"And then there's our Spun End Process†. That's another Wolverine exclusive. By spinning we're able to close or partially close one or both ends of tubing. And do it in one operation, too!"

"Say that one-operation part sounds terrific. It should cut costs to ribbons."

"It does, Mr. Brown. Because in that one operation we can also reduce or neck-down the part. On such fabricated items as accumulators, driers, and other spun-end bulbs, it eliminates press work, reduces assembly time and cuts man-hours."

It adds up: Yes, it adds up to Tubemanship—the one-word picture of Wolverine's skill and facilities. More information? Write today for Wolverine's Statement of Scope. Fast service on an order? You'll get it—*for sure!*

WOLVERINE TUBE DIVISION of Calumet & Hecla, Inc., 1475 Central Avenue, Detroit 9, Michigan.

*REG. U.S. PAT. OFF. †A PATENTED PROCESS RE. 22465

Wolverine Trufin and the Wolverine Spun End Process available in Canada through the Unifin Tube Co., London, Ontario.

WOLVERINE TUBE DIVISION
OF CALUMET & HECLA, INC.
Manufacturers of Quality-Controlled Tubing

PLANTS IN DETROIT, MICHIGAN, AND DECATUR, ALABAMA • Sales Offices In Principal Cities

Export Dept., 13 E. 40th St., New York 16, N.Y.

features valued by shippers and users of material handling equipment — strength, light weight, compactness. It weighs approximately 100 pounds, is constructed of 18-gage steel throughout with 16-gage reinforcements. Inside container is 30 x 30 x 30 inches. Fully collapsed package is 31½ x 31½ x 9 inches. Republic Steel Corp.

FOR MORE DATA CIRCLE NO. 10 ON REPLY CARD

Bead-Type Sealer

. . . easy to handle, apply

A prepared bead-type sealer, Kopeseal, has been developed for use between cope and drag in casting operations. It is a permanently soft mastic compound extruded and furnished in neat, rope-like beads. Easy to handle and apply, it can be used on any size mold to determine whether cope is properly seated, then serves as a gasket-like seal that helps prevent run-outs.

It prevents the metal from flowing around the core print and into the core vent when the fit of the core is loose. Kopeseal is furnished in easy-to-store flat pack cartons

in lengths of 30 inches and in diameters of 3/16, ¼, ⅜, ½, ⅝ and ¾ inch. Presstite Engineering Co.

FOR MORE DATA CIRCLE NO. 11 ON REPLY CARD

Glass Fiber Insulation

. . . ready to apply

Manufacturers with assembly-line operations can obtain glass fiber insulation molded to fit regular and irregular surfaces and ready to apply in assemblies with all the speed and ease of machine parts. A new process permits the manufacture of molded-to-shape parts composed of resilient, plastic bonded Ultrafine glass fiber insulation.

Ultrafine insulation parts can be molded in any size up to 8 x 10 feet in densities varying from 2 to 10 pounds per cu ft and thickness-

es varying from ⅛ inch up, depending on density. Gustin-Bacon Mfg. Co.

FOR MORE DATA CIRCLE NO. 12 ON REPLY CARD

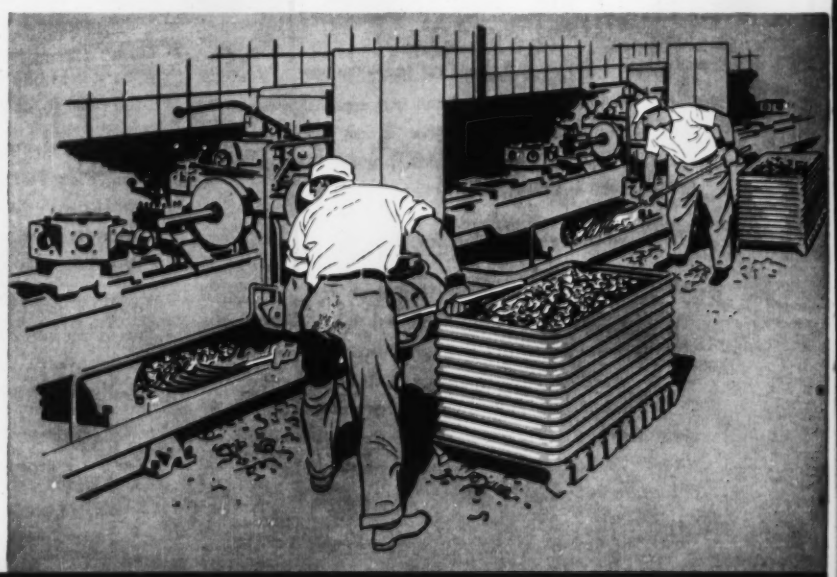
Roof Coating

. . . forces temperature drop

Liquid aluminum heat barrier immediately reflects the infra-red rays of the sun, forcing temperature to drop until it approaches temperature in the shade.

For buildings where an air conditioning installation is prohibitive, this aluminum asbestos roof-

MAY-FRAN



ENGINEERED SCRAP HANDLING

ELIMINATES SHUT-DOWNS

Remove scrap automatically and continuously . . . speed up production . . . with a MAY-FRAN automatic handling system. MAY-FRAN CHIP-TOTES remove chips, turnings and borings from operating machine tools . . . eliminate down-time for manual scrap removal. MAY-FRAN hinged steel belt conveyors then transmit scrap to disposal point or through shearing and baling processes.

1847-MF

ing is a logical answer. Where air conditioning is already in operation, it promises to save hun-

dreds of dollars in operating costs by reducing the heat load. Colonial Refining & Chemical Co.

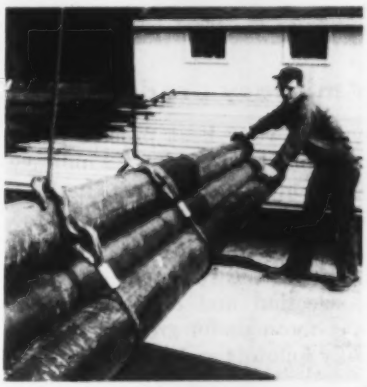
FOR MORE DATA CIRCLE NO. 13 ON REPLY CARD

Wire Rope Processing

. . . mechanically splices eyes

Processing system employs an aluminum alloy clamp or sleeve that is squeezed around wire rope in a 300-ton hydraulic press, eliminating hand splicing. Called JalKlamp, the device is used as a mechanical method of splicing eyes, with or without thimbles, in the ends of wire rope. This splice gives 100 per cent of the breaking strength of the wire rope itself.

Sleeve material is a special noncorrosive aluminum alloy that combines great strength with ability



of cold flowing under pressure at room temperature. Jones & Laughlin Steel Corp.

FOR MORE DATA CIRCLE NO. 14 ON REPLY CARD

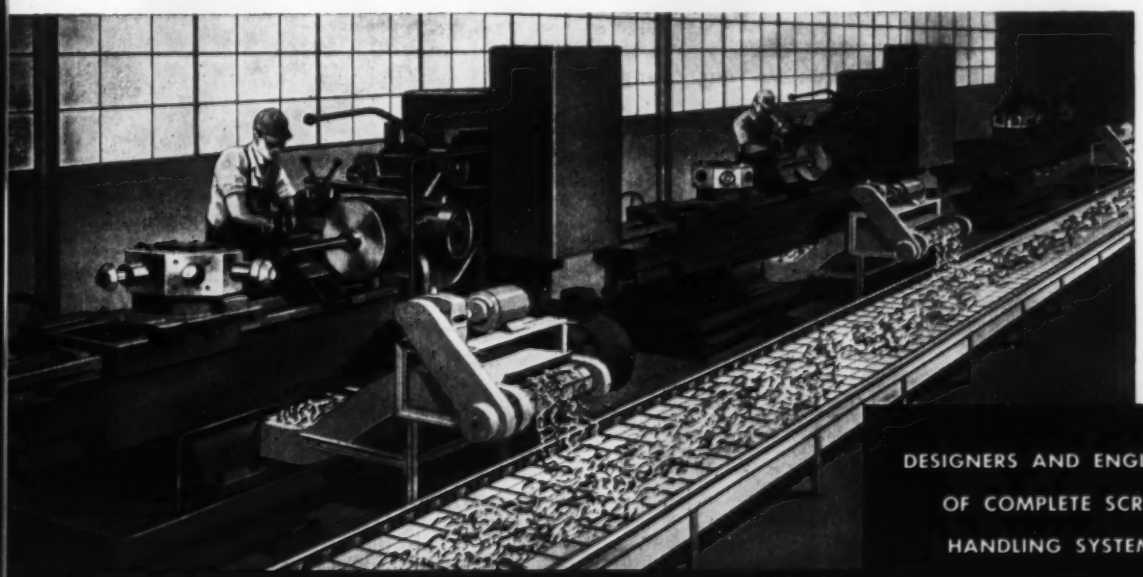
Air Press

. . . adjustable limit control

The Vi-Speed Power House bench-type air press assembles,

bends, straightens, punches, stamps, trims, rivets, broaches, crimps and swages.

It offers simple rugged construc-



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OF COMPLETE SCRAP
HANDLING SYSTEMS

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ENGINEERING, INC.
1725 CLARKSTONE RD.
Cleveland 12, Ohio

Mass produced parts (heavy or abrasive) can be handled through heat treating, machining, inspection and other operations with MAY-FRAN conveyors. Press scrap systems can be made completely automatic. MAY-FRAN engineered handling systems assure outstanding speed and jam-free efficiency with maximum service life. Write today for complete details.

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in the OVER-ALL JOB by CONTINENTAL

Continental Twin Chamber Annealer of the recirculating type with automatic conveyor transfers and close tolerance control for time-temperature cycle.

Two Continental Continuous Controlled Atmosphere Annealers, roller rail type, complete with transfer cars and conveyor systems.

Continental Stamping Annealer continuous roller rail type, complete with basket handling conveyors and automatic controls for work handling and temperature cycles.

Six Continental Top Hat Cover Type Furnaces for bright annealing high carbon steel. Complete with gas generator and automatic controlled time-temperature cycling.

for military production...

Whatever your heat process problems in plant conversion for military production, CONTINENTAL has the answer.

CONTINENTAL jobs begin with analysis of the requirements, then the selection and development of proper methods for greatest results. Finally follows the design, the building, and installation of the equipment including necessary work-handling accessories and control devices—delivering a COMPLETE UNITIZED PRODUCING PACKAGE with results guaranteed.

The broad experience of CONTINENTAL offers you a prompt, sure solution to your change-over program.

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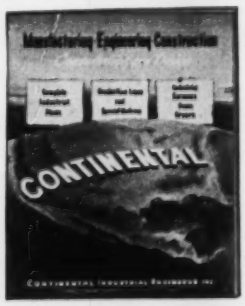


PLANNED MILITARY PRODUCTION
Write for Booklet No. 127

FURNACES
PRODUCTION LINES
CONTINENTAL
SPECIAL MACHINES
COMPLETE PLANTS

NEW PRODUCTS and equipment

tion utilizing Vi-Speed air cylinder power units of 50:1 ratio, 1½ and 6-inch stroke, plus an exclusive adjustable air stroke limit control. The 2-inch ram is nonrotating, with ram extensions supplied for quick and easy adjustment to work requirements. It will handle off-center work, and work can be entered from all four directions. Van Products Co.

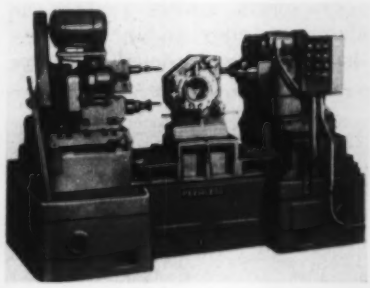
FOR MORE DATA CIRCLE NO. 15 ON REPLY CARD

Boring Machine

. . . precision positioning device

A double-end precision boring machine made by Peerless features a hydraulically-actuated cross-slide with high precision assured by a power-operated mechanical take-off device. Latter also clamps slide in position during machining cycle.

Precision positioning device permits boring of close-center-distance



holes in a single setup without sacrificing benefits of one-time-part fixturing and the desirable longitudinal platen travel features. Designed and built to process pump housing assemblies, this machine performs boring, chamfering and trepanning operations to precise specifications. Peerless Production Co.

FOR MORE DATA CIRCLE NO. 16 ON REPLY CARD

Hydraulic Power Unit

. . . with long stroke

A quill-type hydraulic power unit for actuating tools in a special machine has a capacity of 3 horsepower and a stroke of 8 inches. A companion unit, the Style 22-L, is identical to the style 22 except that it has a 12-inch stroke. The new models are self-contained, hydraulically operated and designed

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you can bank on getting your
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way you ordered it . . .
and delivered exactly when
you need it

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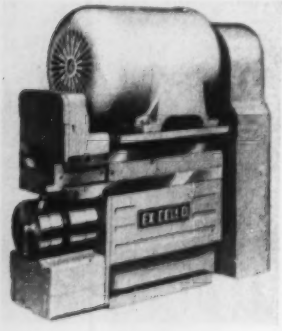
20TH & WHARTON STS., PITTSBURGH 3, PA.

DISTRIBUTORS AND FABRICATORS FOR THE STEEL INDUSTRY

to accommodate single tools or multiple spindle heads for such operations as drilling, reaming, counterboring and spot facing.

The unit cycle may be initiated electrically or manually. Among the hydraulic features are outside



gasket mounted pump and control valve, closely fitting cylinder assembly that does not require rings or packings, quill sealed against both internal hydraulic drain and external coolant. The hydraulic control valve has a single plunger. Ex-Cell-O Corp.

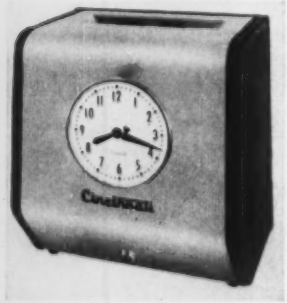
FOR MORE DATA CIRCLE NO. 17 ON REPLY CARD

Time Recorder

. . . audits time record

Payroll time keeping is simplified with the Cincinnati Paymaster, featuring a quick audit time record.

This fully-automatic attendance time recorder is self-regulated every 24 hours and is adaptable to



any payroll time or tabulating card. Electro-mechanical design accommodates any complicated signal and work shift schedules automatically, completely eliminating all manual operations. Cincinnati Time Recorder Co.

FOR MORE DATA CIRCLE NO. 18 ON REPLY CARD

FREE LITERATURE

Catalogs and Clip Sheets

Reply card on page 147 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue

Automatic Milling Machines

Motch & Merryweather Machinery Co.—This company offers a 4-page brochure entitled "Automatic Precision Balancing By Metal Removal." A typical use detailed in this bulletin is the machining of automotive connecting rods.

FOR MORE DATA CIRCLE NO. 19 ON REPLY CARD

Stainless Steel Tubing

American Brass Co.—Flexible stainless steel tubing is described in a bulletin released by American Brass. Data on various types of construction, size and weight ranges, burst pressures, bending diameters and fittings available for assemblies are included.

FOR MORE DATA CIRCLE NO. 20 ON REPLY CARD

Maximum Use, Minimum Aisle

Chicago Tramrail Corp.—Trak-Rak crane is a top or underrunning crane with a vertical rotating column that incorporates fork truck features. Cranes can be furnished with all motions motorized or in any combination of push or motorized. There is no floor load. Examples of applications in 14 typical jobs, plus engineering and capacity drawings and specifications are available in a 20-page reference book.

FOR MORE DATA CIRCLE NO. 21 ON REPLY CARD

The GATX Review

General American Transportation Corp.—A hard-bound 47-page brochure describes and illustrates General American's rail transportation and storage terminal services, and shows how building and maintaining this equipment has led to custom fabricating of an extensive line of other products in many industries. These additional fields include, generally, plate structures, processing machinery, welded vessels, plastic molding and the Kanigen nickel plating process.

FOR MORE DATA CIRCLE NO. 22 ON REPLY CARD

Mill Bearings

Link-Belt Co.—Dimensions and load ratings are available on new heavy-duty roller bearings especially designed for severe operating conditions found in steel mills, mines and foundries. These mill bearings incorporate precision Link-Belt self-aligning roller bearings in a rugged steel pillow block housing.

FOR MORE DATA CIRCLE NO. 23 ON REPLY CARD

Plant Facilities

Champion Forge Co.—"Presenting an Element That Underlies All Other Elements In Forging" is the title of a new brochure offered by this company. It illustrates Champion's four forging shops under one roof. Quality control's latest methods of chemical analysis and impact testing are depicted. Modern die making equipment, heat treating and cleaning are seen.

FOR MORE DATA CIRCLE NO. 24 ON REPLY CARD

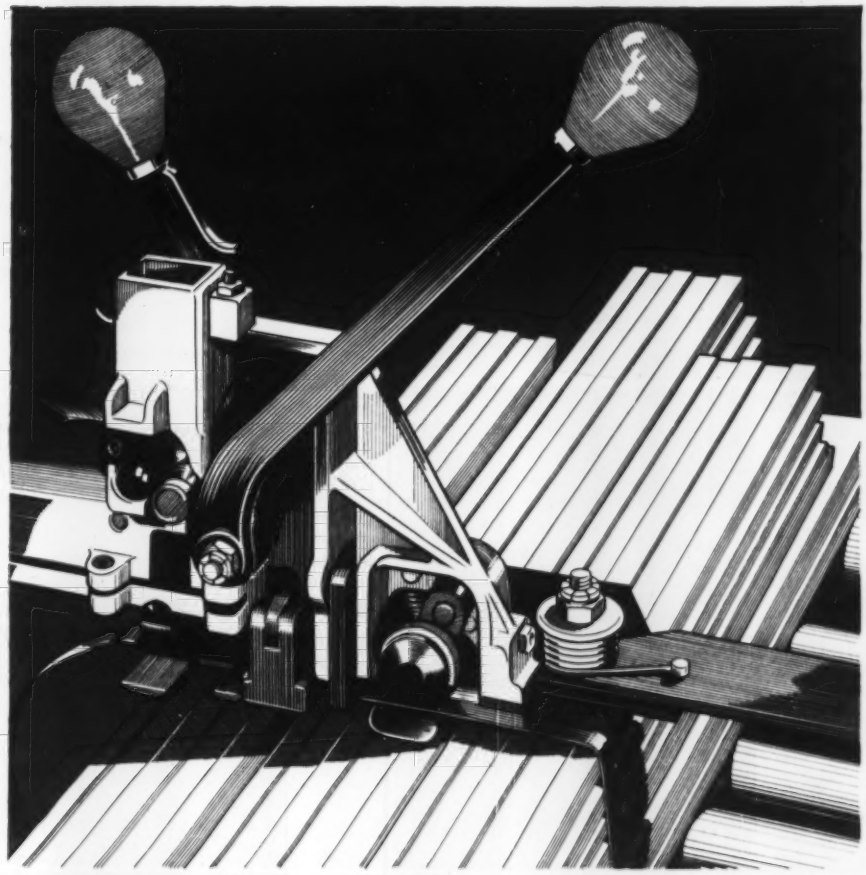
Mounting Pads

Felters Co.—This company offers a 23-page bulletin entitled "Facts About Anchoring Your Machines with Unisorb." What it is, what it does and how it is installed are covered in illustrations and case histories.

FOR MORE DATA CIRCLE NO. 25 ON REPLY CARD

Forming, Stamping, Drawing

Eastern Tool & Mfg. Co.—A 20-page catalog titled "Wire Forming, Metal Stamping, Deep Drawing," covers Eastern's extensive



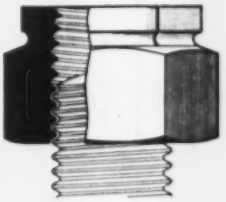
Wherever assemblies must be held together—on metal strappers or dishwashers—more and more original equipment manufacturers and maintenance men are relying on FLEXLOC locknuts for safe, dependable locking.

Why are more and more FLEXLOC locknuts being used to hold assemblies together?

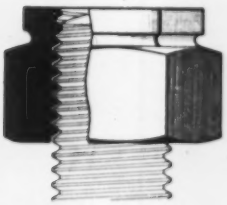
There are a number of reasons. FLEXLOCs are one piece, all metal—no lockwashers to break, no cotter pins to shear, no auxiliary locking devices to deteriorate. FLEXLOCs stay put wherever you place them—as stop nuts or seated nuts—once their locking threads are fully engaged. Because they won't work loose, they reduce costly service calls. FLEXLOCs have higher tensile, are stronger than most other locknuts. And they withstand temperatures as high as 550°F.

FLEXLOCs have the additional advantage of reusability. They can be applied again and again without loss of efficiency. Because they are safe and dependable, you'll find more and more FLEXLOCs being used where vibration is severe—on automotive equipment, compressors, machine tools, household appliances, high-speed looms, aircraft.

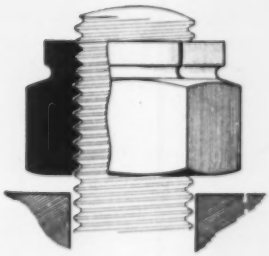
FLEXLOCs are available in a wide range of sizes in any quantity. Stocks are carried by leading industrial distributors everywhere. Write for literature and samples for test purposes. STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.



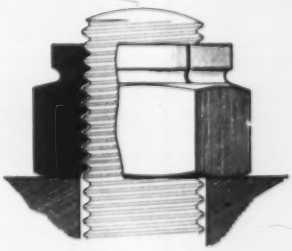
Starting. A FLEXLOC starts like any ordinary nut. Put it on with your fingers. Tighten it with a standard hand or speed wrench.



Beginning to Lock. As the bolt enters the segmented locking section, the section is expanded, and the nut starts to lock.



Fully Locked As a Stop Nut. When 1½ threads of a standard bolt are past the top of the nut, the FLEXLOC is fully locked. A FLEXLOC does not have to seat to lock.



Fully Locked As a Seated Nut. When it is used as a lock or stop nut, the locking threads of the FLEXLOC press inward against the bolt, lifting the nut upward and causing the remaining threads to bear against the lower surface of the bolt threads. Vibration will not loosen a FLEXLOC, yet there is no galling of threads.

FLEXLOC® LOCKNUT DIVISION

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For grinding, smoothing, polishing — metal, wood, leather, plastics, rubber. A grit for every purpose — prompt service on every purchase.

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work in these fields. It shows how the firm's operation is integrated through research and development engineering, tool designing and making, wire forming, metal stamping, deep drawing, assembling, plating and finishing.

FOR MORE DATA CIRCLE NO. 26 ON REPLY CARD

Corrosion Resistant Coating

Mullins Non-Ferrous Castings Corp.—Carboline Co. Division offers literature that defines serviceability, cost and life of each material in a line of corrosion resisting coatings. It's a reference data sheet for engineers who want to select the correct coating. Practical limitations of each material are made clear by tabulated data.

FOR MORE DATA CIRCLE NO. 27 ON REPLY CARD

Design for Extrusion

Aluminum Co. of America—Significant facts necessary to design products as impact extrusions are covered in Alcoa's 16-page booklet. Alcoa impacts are one-piece, seamless, semi-hollow or solid parts having forged bases and one or more extruded side walls. Parts may have round, square, rectangular or oblong cross sections with ribbed, beaded or fluted side walls and bases containing bosses, lugs, other projections or recesses.

FOR MORE DATA CIRCLE NO. 28 ON REPLY CARD

Handling Know-How

Material Handling Institute Inc.—No. 4 in the library of know-how series on material handling is the 10-page booklet entitled "Organization, The Engineering and Training." Organization principles and rules, material handling functions, engineering, operating and training functions, responsibility and authority are the subjects covered.

FOR MORE DATA CIRCLE NO. 29 ON REPLY CARD

Process Equipment

Blaw-Knox Co.—Process Equipment Department offers bulletin No. 2439 describing its line of process equipment. These systems include autoclaves, reaction vessels, electro-vapor heating systems, digesters, contactors, quick-opening doors, agitator assemblies, kettles, package heating and cooling units, pilot plants, vulcanizers,

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stuffing boxes, high pressure storage tanks, lead refining kettles and complete resin plants.

FOR MORE DATA CIRCLE NO. 30 ON REPLY CARD

Temperature Regulators

Spence Engineering Co. Inc.—A four page bulletin describes design and operation features of Spence temperature regulators. A large cutaway diagram of a typical machine with a description of construction and parts is included, with recommended installations of the regulators for instantaneous water heaters, storage water heaters and forced air heating systems.

FOR MORE DATA CIRCLE NO. 31 ON REPLY CARD

Dial Indicators

Nilsson Gage Co. Inc.—A 6-page bulletin on the complete line of new Nilcoid dial indicators with Nilcoid movements and pointer-line dials has been issued. Data on Nilcoid movement and the step-down, pointer-line dial are covered completely in the bulletin. Five models are discussed.

FOR MORE DATA CIRCLE NO. 32 ON REPLY CARD

Unloading Machines

Sahlin Engineering Co.—Sahlin has just issued a 16-page two-color brochure describing and illustrating various designs of their Iron Hand automatic unloading machines for presses. Swinging arm and floor-type machines are included, as are six designs of special-purpose gripping jaws.

FOR MORE DATA CIRCLE NO. 33 ON REPLY CARD

Electrical Conductors

Aluminum Co. of America—Alcoa has prepared a 20-page review to tell some of the things contributed to the electrical industry in the past and some of the things aluminum offers for the future. Detailed text is supported by illustrations. Included is a list of technical reference material available on aluminum conductors.

FOR MORE DATA CIRCLE NO. 34 ON REPLY CARD

Vertical Milling Machines

U. S. Machine Tool Co.—Burke Machine Tool Division offers a 4-page bulletin covering their vertical milling machine. Why they consider it the economical answer to accurate, heavy duty vertical milling problems is discussed and specifications are listed.

FOR MORE DATA CIRCLE NO. 35 ON REPLY CARD

Pivot Punches

Pivot Punch and Die Corp.—A 20-page catalog, showing complete services available to the metal-working industry has been published by Pivot Punch and Die. Facilities for and examples of tools, dies, jigs, fixtures, gages, special machinery, fabrication, machinery repair and rebuilding and parts production are shown.

FOR MORE DATA CIRCLE NO. 36 ON REPLY CARD

Self-Propelled Cranes

Thew Shovel Co.—Heavy-duty Moto-Cranes and Self-Propelled cranes in the 524 series are featured in a 2-color, 20-page descriptive catalog. Detailed design and construction views, along with on-the-job photos, highlight the booklet. Sections are devoted to hydraulic coupling power take-off, details of removable counterweight and crane boom features.

FOR MORE DATA CIRCLE NO. 37 ON REPLY CARD

Varnish Catalog

Minnesota Mining & Mfg. Co.—An up-to-date insulating varnish catalog contains a special section entitled "How to Use Insulating Varnishes." Included is general

For free literature, editorial clips or more information on products described in this section, circle the corresponding number at left. Fill in box below for articles or advertisements not numbered.

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COMPANY

PRODUCTS MANUFACTURED

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use information and special instructions on dipping, vacuum, pressure, brush, spray and baking types of application. Charts include conversion tables, solvent charts, tank capacities and specific gravity correction tables.

FOR MORE DATA CIRCLE NO. 38 ON REPLY CARD

Stainless Steel Tubing

Helical Tube Corp.—A 4-page brochure is offered covering their line of welded and cold drawn stainless steel tubing, seamless stainless tubing and tubing specialties. Fundamentals of stainless steel are listed.

FOR MORE DATA CIRCLE NO. 39 ON REPLY CARD

Electric Cranes

Victor R. Browning & Co. Inc. —A comprehensive 29-page brochure on their electric overhead traveling cranes is offered. Cranes for steel mill, general industrial and cement plant service are covered. Photos, diagrams and specifications are given for each of the types described.

FOR MORE DATA CIRCLE NO. 40 ON REPLY CARD

Metal Hose Products

Universal Metal Hose Co.—A 20-page catalog, divided in five sections, covers seamless all-metal flexible pressure hose, interlocked asbestos packed high-pressure flexible metal hose, interlocked suction, blower and conveyor hose, square-locked conduits and flexible spout tubing. Specifications and photos of each type are included.

FOR MORE DATA CIRCLE NO. 41 ON REPLY CARD

Warm Air Heaters

Dravo Corp.—Bulletin No. 543-B illustrates a line of commercial and industrial, gas fired, warm air unit heaters having output capacities of 88,000 to 160,000 Btu per hour. Two types, one for suspended mounting and one that can be built into duct type heating or air conditioning systems, are covered. Tables list heating and air delivery capacities, outlet temperatures, air pressure drops, weights and dimensions.

FOR MORE DATA CIRCLE NO. 42 ON REPLY CARD

Power Unit Manual

Gregory Industries Inc.—Instructions on how to parallel two units for welding large diameter studs are among important changes incorporated in the revised Nelwelder Power Unit Manual issued by Nelson Stud Welding Division. It contains paralleling diagrams, information on performance possible, models available, power and fuse requirements and general instructions on installation, operation and maintenance.

FOR MORE DATA CIRCLE NO. 43 ON REPLY CARD

EDITORIAL REPRINTS:

Skilled Labor Tomorrow

Skilled labor shortages are creating minor problems today. Unless the nation's apprentice program is stepped up, that shortage will become more serious soon. STEEL's cover story presents some of the factors involved in the apprentice situation and what some foreward-looking executives are doing about it.

FOR MORE DATA CIRCLE NO. 44 ON REPLY CARD

Machining Titanium

Titanium works a lot easier than most machining people think. Biggest problem now is short tool life caused by abrasiveness, galling and high tool tip temperatures. This article, on page 96, is adapted from a report prepared by Curtiss-Wright Corp. for the Air Force.

FOR MORE DATA CIRCLE NO. 45 ON REPLY CARD

Custom Heat Treating

This specialized industry has grown tremendously in the past 20 years. Services range from trouble-shooting to providing heat-treat facilities for the small plant. STEEL's report, beginning on page 100, shows why both small shops and large companies find it profitable to farm out many heat treating jobs, and describes facilities available.

FOR MORE DATA CIRCLE NO. 46 ON REPLY CARD

Lighting Maintenance

It's important to see that lighting upkeep is placed on a well-planned and smartly-executed basis. STEEL's article, on page 114, shows basic procedures, gives tips on methods and equipment.

FOR MORE DATA CIRCLE NO. 47 ON REPLY CARD

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STEEL

May 3, 1954

Market Outlook

THE downward adjustment in the steel industry has been completed.

Steel sales are no longer dropping. Steel prices, as a whole, are remaining steady. The national steel ingot production rate is holding firmly at the slightly increased level it attained two weeks ago.

Principally responsible for the turn-around is the completion of inventory reductions at many metalworking plants. Looming as stimulants to steel demand are the off-chance of a steelworkers' strike this summer and the explosive international situation in Indo-China. Either of them could catapult a flood of buyers into the market for steel.

STEP-UP—Completion of inventory reductions is not limited to steel consumers. Some steel producers have reached their goal on reduction of stocks of semifinished steel. One Midwest steel producer revealed it had lowered its inventories farther than it had planned to. Now it is sharply boosting its ingot output. One big steelmaker is producing ingots at 90 per cent of capacity and another is running at 100 per cent.

Seven of 13 steelmaking districts in the nation produced ingots above the national rate of 69 per cent of capacity in the week ended yesterday.

Despite the firming-up in steel ingot production at the end of April, that month had the lowest output of the first four months of this year.

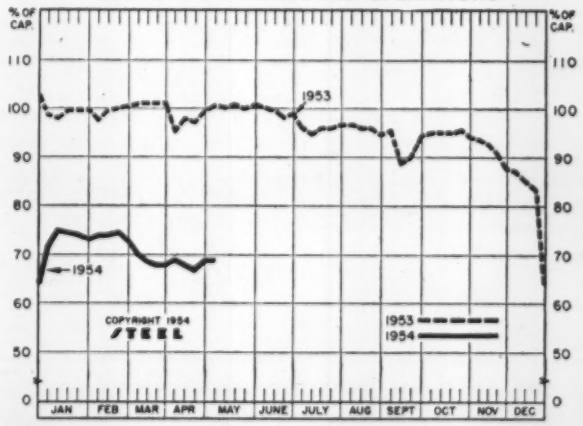
PROMISING—May holds a promise of improvement in steel output. A survey by STEEL showed consumers expect to take 3.7 per cent more steel that month than in March. This reflects continued completions of steel inventory reductions. Reports on May bookings by some of the steel companies bear this out. Benjamin F. Fairless, chairman, United States Steel Corp., says he not only thinks that his company's business will be as good in the next 90 days as it is now but that it will improve to some extent. "That," he points out, "would take us into the third quarter."

A MAINSTAY—One of the reasons for encouragement is the construction outlook. A good volume of construction work continues to come out, and considerable future work is on the drawing boards. Indicative of the strength of construction, 8.2 per cent of all finished steel shipped by mills this year is structural shapes. In all of last year they totaled only 6.3 per cent. The construction industry is now the mainstay of sales of steel plate.

IN DEMAND—The government program to build bins for surplus grain is giving a fillip to the demand for galvanized steel sheets. Other seasonal upward influences on the galvanized sheet business are requirements for air-conditioning equipment and for farms. Air-conditioning equipment also is a good outlet now for cold-rolled carbon steel sheets.

PICKING UP—Producers of cold-finished steel bars note a pickup in demand. Consequently they are turning to producers of hot-rolled bars for increased supplies of raw stock. One cold-drawer reports it is operating a double shift.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended May 2	Change	Same Week 1953	Same Week 1952
Pittsburgh	70	— 2*	97	44
Chicago	78.5	— 1*	106.5	50
Mid-Atlantic	56	— 1	97.5	70
Youngstown	70	+ 3	106	45
Wheeling	86	+ 2	101	77
Cleveland	77.5	+ 2.5*	102.5	44
Buffalo	67.5	0	106.5	35
Birmingham	56.5	+ 3	102	44
New England	60	0	86	35
Cincinnati	60.5	— 1	97.5	60
St. Louis	72.5	+ 17	92	44.5
Detroit	60.5	0	109	64.5
Western	84	+ 3	110	82.5
National Rate	69	0	100.5	53

INGOT PRODUCTION‡

	Week Ended May 2	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	101.6†	101.8	102.6	140.8
NET TONS (In thousands)	1,632†	1,636	1,648	2,262

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,459 in 1953; 2,077,040 in 1952.

The Metalworking Outlook—p. 47 Technical Outlook—p. 95

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Apr. 27

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., alloy	$8.575	Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.433
Rails, light, 40 lb	5.767	Bars, H.R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	4.963	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	5.125	Bars, H.R., carbon	4.873	Pipe, black, buttweld (100 ft)	14.454	Black plate, can making quality	6.233
Axles, railway	7.250	Bars, reinforcing	4.900	Pipe, galv., buttweld (100 ft)	17.731	Wire, drawn, carbon	7.713
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., carbon	7.960	Pipe, line (100 ft)	141.960	Wire, drawn, stainless, 430 (lb)	0.545
Plates, carbon	4.550	Bars, C.F., alloy	11.000	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	5.653
Structural Shapes	4.367	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.488
Bars, tool steel, carbon (lb)	0.415	Sheets, H.R., carbon	4.755	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	6.847
Bars, tool steel, alloy, oil hardening die (lb)	0.505	Sheets, C.R., carbon	5.696	Tubing, mechanical, carbon (100 ft)	‡	Woven wire fence (20-rod roll)	16.174
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.075	Sheets, galvanized	6.895	Tubing, mechanical, stainless, 304 (100 ft)	161.193	‡ Not available.	
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.550	Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.000				
		Strip, C.R., carbon	7.236				

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Apr. 27 1954	Apr. 20 1954	Month Ago	Apr. Average
(1947-1949=100)	140.8	140.9	140.9	140.9

STEEL's FINISHED STEEL PRICE INDEX*

	Apr. 29 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	189.74	189.74	189.74	181.31	154.01
Index in cents per lb	5.140	5.140	5.140	4.912	4.172

STEEL's ARITHMETICAL PRICE COMPOSITES

	Apr. 29 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT*	$113.70	$113.70	$113.70	$110.98	$94.45
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	55.04	46.63
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	46.10
Malleable Pig Iron, GT	57.27	57.27	57.27	55.77	47.34
Steelmaking Scrap, GT	26.00	26.00	24.50	41.67	23.25

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Apr. 29 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.35
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	4.405	4.405	4.405	4.502	3.816
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.25
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, del., Philadelphia	4.38	4.38	4.38	4.13	3.492
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.10	4.10	4.10	4.35	3.50
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.10	4.10	4.10	4.35	3.65
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.25
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	4.425	4.425	4.425	3.975-4.225	3.50
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.25
Strip, C.R., Pittsburgh	5.45	5.45	5.45	5.10-5.80	4.375
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.00
Strip, C.R., Detroit	5.65	5.65	5.65	5.30-6.05	4.20
Wire, Basic, Pitts.	5.525	5.525	5.525	5.225-5.475	4.15
Nails, Wire, Pittsburgh	6.55	6.55	6.55	6.35	5.15
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$7.75
SEMIFINISHED STEEL					
Billets, forging, Pitts (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, ⅞-⅜" Pitts.	4.525	4.525	4.525	4.425	3.775

PIG IRON, Gross Ton	Apr. 29 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	46.00
Basic, deld, Phila.	59.66	59.66	59.66	59.25	49.39
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	46.25
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, del. Phila.	60.16	60.16	60.16	59.75	49.89
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.43
Malleable, Valley	56.50	56.50	56.50	55.00	46.50
Malleable, Chicago	56.50	56.50	56.50	55.00	46.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	228.00*	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts.	$26.50	$26.50	$25.50	$43.00	$24.00
No. 1 Heavy Melt, E. Pa.	22.00	22.00	22.00	42.50	22.75
No. 1 Heavy Melt, Chicago	29.50	29.50	26.00	39.50	23.00
No. 1 Heavy Melt, Valley	28.50	27.50	23.50	43.50	22.00
No. 1 Heavy Melt, Cleve.	25.50	24.50	20.50	41.25	18.50
No. 1 Heavy Melt, Buffalo	25.50	23.50	24.00	43.50	23.50
Rails, Rerolling, Chicago	39.50	39.50	34.50	51.50	27.75
No. 1 Cast, Chicago	38.50	38.50	36.00	42.50	27.50

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.25
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	17.00	17.00
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.40

NONFERROUS METALS

(cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 13, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb del.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 30.00 del. Conn. Valley, 30.125 del. Midwest; Lake 30.00 del.; Fire refined 29.75 del.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $145-$150 per troy oz.

Lead: Common 13.80, chemical 13.90, corroding 13.90, St. Louis; New York basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8%, selfpalletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks, 1.3 in. diameter, 46.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more, f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York, $232-$235 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or

DAILY NONFERROUS PRICE RECORD

	Price Apr. 29	Last Change	Previous Price	Mar. Avg.	Feb. Avg.	Apr. 1953 Avg.
Copper	30.00	Apr. 12	29.75-30.00	29.865	29.750	30.755
Lead	13.80	Apr. 12	13.55	12.735	12.610	12.473
Zinc	10.25	Mar. 29	9.75	9.657	9.369	11.000
Tin	95.25	Apr. 28	97.00	92.518	85.181	102.567
Nickel	60.00	Jan. 14, 1953	56.50	60.000	60.000	60.000
Aluminum	21.50	July 15, 1953	20.50	21.500	21.500	20.500
Magnesium	27.00	Mar. 9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on: Copper, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99 + %, del.; Magnesium 99.8%, Freeport, Tex.

ingots for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $140-$150 per troy oz nom.

Palladium: $21 per troy oz.

Platinum: $84-$87 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $70-$75 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, New York, spot, 95.25 prompt, 95.25.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.) $4.72; grade A-2 (0.5% Fe max.) $4.46 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $4.65 per lb f.o.b. shipping point; less than 1000 lb $4.80; 99+% hydrogen reduced, $4.95. Treated ingots $6.70.

Zinc: Prime Western 10.25, brass special 10.50, intermediate 10.75, E. St. Louis, freight allowed over 0.50 per pound. High grade 11.60, special high grade 11.75, die casting alloy ingot 14.25, del.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.
(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloys 21.00-22.50; No. 12 foundry alloy (No. 2 grade) 20.00-21.00, 5% silicon alloy, 0.60 Cu max., 22.50-23.50; 13 alloy, 0.60 Cu max., 22.50-23.50; 195 alloy 21.75-22.75; 108 alloy 20.50-21.50 steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 21.00-22.00; grade 2, 20.00-21.00; grade 3, 18.50-19.50; grade 4, 18.00-19.00.

Brass Ingot: Red brass, No. 115, 26.00; tin bronze No. 225, 38.50. No. 245, 32.25; high-leaded tin bronze, No. 305, 31.00; No. 1 yellow, No. 405, 22.25; manganese bronze No. 421, 26.75.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 27.00; AZ91C, 31.50; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb, 36.53; l.c. 37.03. Magnet wire del., 15,000 lb or more 41.83; l.c.l. 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $19.00 per cwt; pipe, full coils $19.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 100,000 lb and over, f.o.b. mill.) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $11; forging billets, $6; hot-rolled and forged bars, $6.

ZINC

Sheets 23.00, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50, f.o.b. mill, 36,000 lb and over. Plates 19.00-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1 cent per linear foot.

NICKEL, MONEL, INCONEL	"A" Nickel	Monel	Inconel
Sheet, C.R. ...	86.5	67.5	92.5
Strip, C.R. ...	92.5	70.5	98.5
Plate, H.R. ...	84.5	66.5	90.5
Rod, Shapes ..	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks ..	....	60.0	....

ALUMINUM

(30,000 lb base; freight allowed over 499 lb) Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-49	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* 72-180 in. lengths. † 26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. width or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
4S-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* 24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 11S-T3	Round 17S-T4	Hexagonal 11S-T3	Hexagonal 17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 43.8-34.4, in specific lengths 36-144 in. diameters 0.375-8 in.; rectangles and squares, Class 1, 50.2-38.4 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
⅜	$15.05	2	$ 46.30
1	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 53.000, 20,000 lb or more 0.250-in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 67.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ⅛-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clippings 13.00; low copper clippings 13.00; mixed clippings 11.00-12.00; old sheet 10.50-11.00; borings and turnings 7.00; pistons and struts 7.00; crankcases 10.00-11.00; industrial castings 10.00-11.00.

Copper and Brass: Heavy copper and wire, No. 1 24.50; No. 2 copper 23.00; light copper 21.00; No. 1 composition red brass 18.50; No. 1 composition turnings 18.00; mixed brass turnings 13.00; new brass clippings 18.00; No. 1 brass rod turnings 14.00; light brass 12.00; heavy yellow brass 14.00; new brass rod ends 15.00; auto radiators, unsweated 14.00; cocks and faucets 16.00; brass pipe 17.00.

Lead: Heavy 10.75-11.25; battery plate 5.75-6.25; linotype and stereotype 13.00; electrotype 11.25; mixed babbitt 12.75.

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 16.50-17.50.

Monel: Clippings 24.00-26.00; old sheet 22.00-24.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 55.00-60.00; block tin pipe 75.00-80.00; No. 1 babbitt 45.00-50.00.

Zinc: Old zinc, 4.50; new die cast scrap, 4.00; old die cast scrap, 3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 15.50-16.00; 51S, 52S clippings 15.50-16.00; 14S, 17S, 24S clippings 14.50-15.00; mixed clippings 14.50-15.00; old sheet 13.00-13.50; old cast 13.00-13.50; clean old cable, free of steel 15.50-16.00; borings and turnings 13.00-14.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 26.75-27.00; No. 2 copper 25.25-25.50; light copper 23.75-24.00; refinery brass (60% copper) per dry copper content 22.25-22.50; auto radiators, 16.25.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 26.75-27.00; No. 2 copper 25.25-25.50; light copper 23.75-24.00; No. 1 composition borings 19.50-20.00; No. 1 composition solids 20.00-20.50; heavy yellow brass solids 15.50-16.00; yellow brass turnings 14.75-15.00; radiators 16.50.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.75 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.165; 200-499 lb $1.15; 500-999 lb $1.145; 1000 lb or more $1.14.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.
Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.
Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.
Copper Sulphate: 100-5000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.
Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.
Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.
Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.
Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.
Sodium Stannate: Less than 100 lb 73.5; 100-500 lb 59.1; 700-1900 lb 56.6; 2000-9900 lb 54.8; 10,000 lb or more 53.7.
Stannous Chloride (Anhydrous): Less than 50 lb $1.60; 50 lb $1.26; 100-300 lb $1.11; 400-900 lb $1.066 1000-1900 lb $1.061; 2000-4900 lb $1.025; 5000-19,000 lb 96.4; 20,000 lb and over 90.3.
Stannous Sulphate: Less than 50 lb $1.298; 50 lb 99.8; 100-1900 lb 97.8; 2000 lb and over 95.8.
Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.88c	...	48.44	26.000	26.000	25.250
Yellow Brass	41.72	33.50d	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90% ..	46.96	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	59.43g	57.69	....	23.625	23.375	11.613
Phosphor Bronze, A, 5% ..	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Munts Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Nonferrous Metals

Nickel producers are looking ahead to the day when they will be seeking business. They're very conscious of the present problems of their civilian customers

"CUSTOMERS WANTED" signs are being lettered by nickel producers.

That may seem anomalous to purchasing agents who've seen no respite in their quest for the vital metal. They claim rations for civilian use are little above a survival level and that second quarter shows no improvement.

The Long Pull—Producers of the metal naturally want to encourage this civilian use. It's their bread-and-butter market. Thinking ahead to return of nickel normalcy, producers have very much in mind the present problems of their customers. They're also looking for new outlets in the future.

Listen to this appraisal by Dr. John F. Thompson, chairman, International Nickel Co. of Canada Ltd., in his message to company shareholders last week in Toronto: "Considerable new nickel production capacity will have been established during the next few years and this may well prove to be temporarily in excess of market demand."

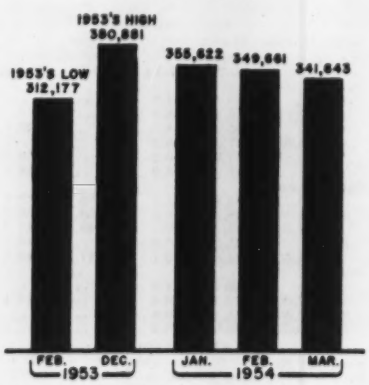
Other Competition—Noting that "nickel is in world-wide competition with other steel alloying elements and with a wide variety of other metals such as copper, zinc and tin," Dr. Thompson expressed the hope that "other producers and those newly coming into the field will feel, as we do, that production carries with it the responsibility for developing and expanding the market for nickel.

"Supply remaining for civilian purposes after providing for these heavy and abnormal demands (defense and stockpile) has been found to be definitely inadequate," continued Dr. Thompson. "As a consequence, the period of restriction of peacetime uses for nickel is being prolonged to the detriment of civilian markets." Nickel price has held at 60 cents for 15 months and is unlikely to change soon, according to these statements: "It is important that the price remain stable for some period of time, resisting pressures in either direction" and "Price of nickel should at all times reflect not only short-term but also long-term considerations."

Uses—Two-thirds of the free world's nickel supply last year came to the U. S., with the steel industry again the largest consumer. Some 45 million pounds of nickel went into the record tonnage of stainless and heat-resisting steels produced here. While over the years there has been a reduction in amount of nickel used per ton of steel made, there has been greater over-all use of alloyed steels, and many of the lower nickel-containing steel compositions have developed uses and fields of their own which were previously not economically open to steels with higher alloys content.

SHRINKING

Fabricators Refined Stocks of Copper
(Tons of 2000 pounds)



Source: Copper Institute

Other applications Inco counts on for increased nickel consumption include plating, nonferrous alloys, nickel-chromium alloys for jet engines, electrical and electronics industries, cast irons, and in atomic energy plants for concentration and processing of atomic fuels. Inco thinks there will be plenty of nickel for the job. Its reserves both in tonnage of ore and of contained nickel are highest in the company's history.

"Imported from Canada"

Canadian aluminum will be found in more and more U. S. metalworking products. Well over one million tons are either contracted for or firmly offered fabricators between now and the end of 1958. Cinching this probability was a court order allowing Alcoa to continue its purchase of 600,000 tons of Canadian metal from Aluminum Import Corp. over a six-year period commencing in 1953. The Justice department, which sought to stop the deal, in effect is bowing out as gracefully as possible. Informed observers also see the order as putting the ax to whatever faint hope was left for a third-round domestic aluminum expansion program.

Aluminum Import's announced proposal to make available 110,000 tons of aluminum yearly to nonintegrated U. S. users will have priority over deliveries to Alcoa (and presumably to Kaiser, whose contract with Import was not challenged by the government). From the Alcoa tonnage, Olin Industries Inc. is entitled to 40,000 tons of primary pig or ingot each year through 1957 and 20,000 tons during 1958. Should Olin build a primary smelter, it may cancel its option on 15 months' notice. Alcoa is allowed to buy 50,000 tons of additional Canadian aluminum yearly upon 15 days' notice to the government. The court order, incidentally, was entered exactly 17 years from the date of first antitrust filing against Alcoa. While Alcoa notes it "has not enjoyed the experience of protracted litigation," it feels the results achieved "have in many ways been constructive."

The Customers Are There

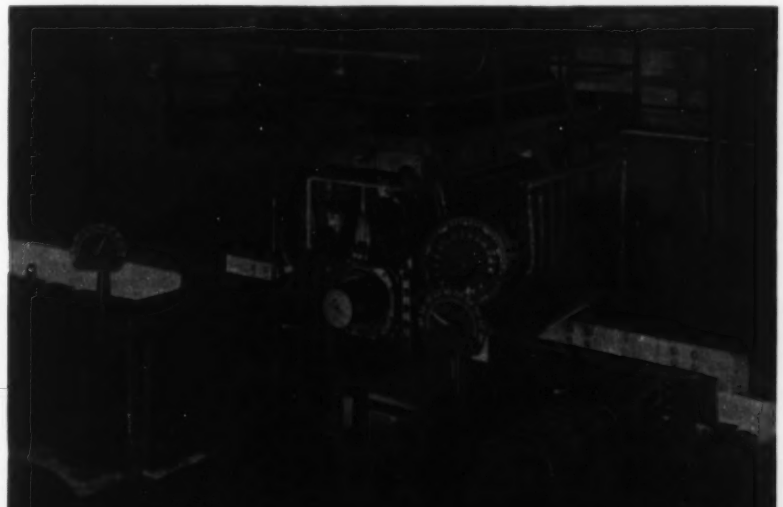
Magnesium men are finding surprising strength in their industry as their doorknob pulling sales campaign finds new customers. Castings men are still down at the mouth, but wrought product fabricators find a lot to be cheerful about. Statistics show March shipments of wrought products up 22 per cent from February to 645 tons, the fourth consecutive monthly increase. First-quarter totals were off 9 per cent from the fourth quarter of last year because of a poor January. Primary output in March, 6545 tons, was highest in eight months, and first quarter total of 18,847 tons was less than 1 per cent below 1953's fourth quarter.

Market Memos

• Merry-go-round on copper scrap prices is giving custom smelters, ingotmakers and exporters a fast whirl. The half-cent increase last week has the smelters against the wall. With No. 1 copper scrap as high as 27 cents and their processing costs about 3 cents or more, they can't afford another round.

Newport Steel

HELPS KEEP YOUR INVENTORY DOWN



Flexibility in operation enables Newport Steel to adjust their schedules and complete your order when you want it, always strictly according to your specifications. From the heart of America's greatest industrial growth, Newport makes fast, economical delivery, too, by rail, barge or truck. You thus avoid the expense of heavy inventories while ensuring the continuity of your production and obtaining the high quality for which Newport has been famous for 69 years.

PRODUCTS OF NEWPORT STEEL

- Hot-Rolled Steel in Coil
- Hot-Rolled Pickled Steel in Coil
- Electric Weld Line Pipe
- Hot-Rolled Sheets
- Galvanized Sheets
- Galvannealed Sheets
- Colorbond Sheets
- Hot-Rolled Pickled Sheets
- Electrical Sheets
- Alloy Sheets and Plates
- Roofing and Siding
- Eave Trough and Conductor Pipe
- Culverts

ECONOMICAL WATERAIL DELIVERY

Newport Steel is situated on the Mississippi-Ohio River system and the great Cincinnati rail hub. With the advantage of location, new river barge facilities and seven major railroads, Newport gives economical, dependable delivery to industrial areas throughout the Middle West and South.

Newport Steel CORPORATION

NEWPORT, KENTUCKY

STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on page 155. Key to footnotes, page 157.

SEMIFINISHED

INGOTS, Carbon Forging (NT)
Fontana,Calif. K1 ....$86.00
Munhall,Pa. U5 .....59.00

INGOTS, Alloy (NT)
Detroit R7 .....$63.00
Fontana,Calif. K1 ....88.00
Midland,Pa. C18 .....62.00
Munhall,Pa. U5 .....62.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)
Aliquippa,Pa. J5 .....$62.00
Bessemer,Pa. U5 .....62.00
Clairton,Pa. U5 .....62.00
Ensley,Ala. T2 .....62.00
Fairfield,Ala. T2 ....62.00
Fontana,Calif. K1 ....70.00
Gary,Ind. U5 .....62.00
Johnstown,Pa. B2 ....62.00
Lackawanna,N.Y. B2..62.00
Munhall,Pa. U5 .....62.00
So.Chicago,Ill. U5 ....62.00
So.Duquesne,Pa. U5 ..62.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$75.50
Bessemer,Pa. U5 .....75.50
Buffalo R2 .....75.50
Clairton,Pa. U5 .....75.50
Cleveland R2 .....75.50
Conshohocken,Pa. A3 80.50
Detroit R7 .....78.50
Ensley,Ala. T2 .....75.50
Fairfield,Ala. T2 .....75.50
Fontana,Calif. K1 ....83.50
Gary,Ind. U5 .....75.50
Geneva,Utah C11 .....75.50
Houston S5 .....83.50
Johnstown,Pa. B2 ....75.50
Lackawanna,N.Y. B2..75.50
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....75.50
Seattle B3 .....89.00
So.Chicago R2,U5,W14 75.50
So.Duquesne,Pa. U5 ..75.50
So.SanFrancisco B3 ...85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$82.00
Buffalo R2 .....82.00
Canton,O. R2, T7 ....82.00
Conshohocken,Pa. A3..89.00
Detroit R7 .....84.00
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....82.00
Houston S5 .....90.00
Ind.Harbor,Ind. Y1 ...82.00
Johnstown,Pa. B2 ....82.00
Lackawanna,N.Y. B2..82.00
LosAngeles B3 .....102.00
Massillon,O. R2 .....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
So.Chicago R2,U5,W14.82.00
So.Duquesne,Pa. U5 ...82.00
Struthers,O. Y1 .....82.00
Warren,O. C17 .....82.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$92.50
Canton,O. R2 .....92.50
Cleveland R2 .....92.50
Fontana,Calif. K1 ...113.50
Gary,Ind. U5 .....92.50
Massillon,O. R2 .....92.50
So.Chicago,Ill. R2 ....92.50
So.Duquesne,Pa. U5 ...92.50

SHEET BAR (NT)
Fontana,Calif. K1 ..$93.18

SKELP
Aliquippa,Pa. J5 .....3.85
Munhall,Pa. U5 .....3.75
Warren,O. R2 .....3.75
Youngstown R2, U5 ....3.75

WIRE RODS
AlabamaCity,Ala. R2 ..4.525
Aliquippa,Pa. J5 .....4.525
Alton,Ill. L1 .....4.70
Buffalo W12 .....4.525
Cleveland A7 .....4.525
Donora,Pa. A7 .....4.525
Fairfield,Ala. T2 .....4.525
Fontana,Calif. K1 ....5.325
Houston S5 .....4.925
Johnstown,Pa. B2 ....4.525
Joliet,Ill. A7 .....4.525
KansasCity,Mo. S5 ....4.865
Kokomo,Ind. C18 ....4.625
LosAngeles B3 .....5.325
Minnequa,Colo. C10 ....4.775
Monessen,Pa. P7 .....4.525
No.Tonawanda,N.Y.B11 4.525
Pittsburg,Calif C11 ...5.175
Portsmouth P12 .....4.525
Roebling,N.J. R5 .....4.625
So.Chicago,Ill. R2 ....4.525
SparrowsPoint,Md. B2..4.625
Sterling,Ill.(1) N15 ...4.525
Struthers,O. Y1 .....4.525
Torrance,Calif. C11 ...5.325
Worcester,Mass. A7 ...4.825

STRUCTURALS

Carbon Steel Shapes
AlabamaCity,Ala. R2 ...4.10
Aliquippa,Pa. J5 .....4.10
Bessemer,Ala. T2 .....4.10
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2 ...4.10
Johnstown,Pa. B2 ....4.15
KansasCity,Mo. S5 ....4.70
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.80
Minnequa,Colo. C10 ....4.55
Munhall,Pa. U5 .....4.10
Niles,Calif. P1 .....4.80
Phoenixville,Pa. P4 ....4.15
Seattle B3 .....4.85
So.Chicago,Ill. U5, W14.4.10
So.SanFrancisco B3 ....4.75
Torrance,Calif. C11 ....4.80
Weirton,W.Va. W6 ....4.10

Wide Flange
Bethlehem,Pa. B2 ....4.15
Clairton,Pa. U5 .....4.10
Fontana,Calif. K1 ....5.10
Lackawanna,N.Y. B2 ..4.15
Munhall,Pa. U5 .....4.10
Phoenixville,Pa. P4 4.15
So.Chicago,Ill. U5 ....4.10

Alloy Stand. Shapes
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....6.40
Gary,Ind. U5 .....5.00
Munhall,Pa. U5 .....5.00
So. Chicago,Ill. U5 ....5.00

H.S, L.A. Stand. Shapes
Aliquippa,Pa. J5 .....6.175
Bessemer,Ala. T2 .....6.175
Bethlehem,Pa. B2 .....6.20
Clairton,Pa. U5 .....6.175
Fairfield,Ala. T2 .....6.175
Fontana,Calif. K1 .....6.825
Gary,Ind. U5 .....6.175
Geneva, Utah C11 .....6.175
Ind.Harbor,Ind. I-2 ...6.175
Ind.Harbor,Ind. Y1....6.675
Johnstown,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ..6.20
LosAngeles B3 .....6.85
Munhall,Pa. U5 .....6.175
Seattle B3 .....6.90
So.Chicago,Ill. U5,W14 6.175
So.SanFrancisco B3 ..6.80
Struthers,O. Y1 .....6.675

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....6.20
Lackawanna,N. Y. B2 ..6.20
Munhall,Pa. U5 .....6.125
So.Chicago,Ill. U5 ....6.125

PILING

Bearing Piles
Munhall,Pa. U5 .....4.10
So.Chicago,Ill. U5 ....4.10

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ...4.925
Lackawanna,N.Y. B2 ..4.925
Munhall,Pa. U5 .....4.925
So.Chicago,Ill. U5 ....4.925

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Ashland,Ky. (15) A10 ..4.10
Bessemer,Ala. T2 .....4.10
Clairton,Pa. U5 .....4.10
Claymont,Del. C22 .....4.10
Cleveland J5, R2 .....4.10
Coatesville,Pa. L7 .....4.10
Conshohocken,Pa. A3 ..4.10
Ecorse,Mich. G5 4.25
Fairfield,Ala. T2 .....4.10
Fontana,Calif.(30) K1 ..4.75
Gary,Ind. U5 .....4.10
GraniteCity,Ill. G4 ....4.30
Harrisburg,Pa. C5 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2, Y1.4.10
Jonnstown,Pa. B2 .....4.10
Lackawanna,N.Y. B2 ...4.10
LoneStar,Tex. L6 .....4.40
Minnequa,Colo. C10 ....4.95
Munhall,Pa. U5 .....4.10
Pittsburgh J5 .....4.10
Riverdale,Ill. A1 .....4.10
Seattle B3 .....5.00
Sharon,Pa. S3 .....4.10
So.Chicago,Ill. U5, W14.4.10
SparrowsPoint,Md. B2 ..4.10
Steubenville,O. W10 ....4.10
Warren,O. R2 .....4.10
Weirton,W.Va. W6 ....4.10
Youngstown R2, U5, Y1.4.10

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 ....5.90
Geneva,Utah C11 .....5.25

PLATES, Wrought Iron
Economy,Pa. B14 ....9.30

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.25
Bessemer,Ala, T2 .....6.25
Clairton,Pa. U5 .....6.25
Cleveland J5 .....6.25
Conshohocken,Pa. A3 ..6.25
Ecorse,Mich. G5 6.40
Fairfield,Ala. T2 .....6.25
Fontana,Calif.(30) K1 ..6.95
Gary,Ind. U5 .....6.25
Geneva,Utah C11 .....6.25
Ind.Harbor,Ind. I-2 ..6.25
Ind.Harbor,Ind. Y1 ....6.75
Johnstown,Pa. B2 ....6.25
Lackawanna,N.Y. B2 ...6.25
Munhall,Pa. U5 .....6.25
Pittsburgh J5 .....6.25
Seattle B3 .....7.15
Sharon,Pa. S3 .....6.25
So.Chicago,Ill U5, W14.6.25
SparrowsPoint,Md. B2 ..6.25
Youngstown U5 .....6.25
Youngstown Y1 .....6.75

PLATES, Alloy
Claymont,Del. C22 .....5.55
Coatesville,Pa. L7 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Johnstown,Pa. B2 .....5.55
Munhall,Pa. U5 .....5.55
Sharon,Pa. S3 .....5.55
So.Chicago,Ill. U5, W14.5.55
SparrowsPoint,Md. B2 ..5.55

FLOOR PLATES
Cleveland J5 .....5.15
Conshohocken,Pa. A3 ...5.15
Harrisburg,Pa. C5 ....5.15
Ind.Harbor,Ind. I-2 ....5.15
Munhall,Pa. U5 .....5.15
So.Chicago,Ill. U5 ....5.15

PLATES, Ingot Iron
Ashland c.l. (15) A10 ..4.35
Ashland l.c.l.(15) A10..4.85
Cleveland, c.l. R2 .....4.70
Warren,O. c.l. R2 .....4.70

BARS

BARS, Hot-Rolled Carbon
Aliquippa,Pa. J5 .....4.15
Alton,Ill. L1 .....4.35
Atlanta,Ga. A11 .....4.35
Bessemer,Ala. T2 .....4.15
Birmingham,Ala. C15 ..4.15
Buffalo(31) R2 .....4.18
Clairton,Pa. U5 .....4.15
Cleveland(31) R2 .....4.21
Detroit R7 .....4.30
Ecorse,Mich. G5 4.30
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 ....4.85
Gary,Ind. U5 .....4.15
Gadsden,Ala.(31) R2 ...4.18
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1.4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.75
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.60
Niles,Calif. P1 .....4.85
N.Tonawanda,N.Y. B11.4.15
Pittsburg,Calif. C11 ....4.85
Pittsburgh J5 .....4.15
Portland,Oreg. O4 .....4.90
Seattle B3, N14, P23....4.90
So.Chicago U5, W14 ....4.15
Chicago(31) R2 .....4.22
So.Duquesne,Pa. U5 ....4.15
So.SanFran.,Calif. B3 ..4.90
Sterling,Ill. (1) N15 ....4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Weirton,W.Va. W6 ....4.15
Youngstown U5 .....4.15
Youngstown(31) R2 ....4.20

Bars, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....4.875
Buffalo R2 .....4.875
Canton,O. R2, T7 ....4.875
Clairton,Pa. U5 .....4.875
Detroit R7 .....4.975
Ecorse,Mich. G5 5.025
Fairless,Pa. U5 .....5.025
Fontana,Calif. K1 ....5.925
Gary,Ind. U5 .....4.875
Houston S5 .....5.275
Ind.Harbor,Ind. I-2,Y1.4.875
Johnstown,Pa. B2 ....4.875
KansasCity,Mo. S5 ....5.475
Lackawanna,N.Y. B2 ..4.875
LosAngeles B3 .....5.925
Massillon,O. R2 .....4.875
Midland,Pa. C18 .....4.875
So.Chicago R2,U5,W14 .4.875
So.Duquesne,Pa. U5 ...4.875
Struthers,O. Y1 .....4.875
Warren,O. C17 .....4.875
Youngstown U5 .....4.875

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 ....6.225
Bessemer,Ala. T2 .....6.225
Bethlehem,Pa. B2 .....6.225
Clairton,Pa. U5 .....6.225
Ecorse,Mich. G5 6.375
Fairfield,Ala. T2 .....6.225
Fontana,Calif. K1 ....7.475
Gary,Ind. U5 .....6.225
Ind.Harb.,Ind. Y1 ....6.725
Ind.Harb.,Ind. I-2 ....6.225
Johnstown,Pa. B2 .....6.225
Lackawanna,N.Y. B2 ..6.225
LosAngeles B3 .....6.925
Pittsburgh J5 .....6.225
Seattle B3 .....6.975
So.Chicago W14 .....6.225
So.Duquesne,Pa. U5 ....6.225
So.SanFrancisco B3 ...6.975
Struthers,O. Y1 .....6.725
Youngstown U5 .....6.225

BAR SIZE ANGLES;H.R.CARBON
Bethlehem,Pa. B2 ....4.35
BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....4.15
Atlanta A11 .....4.35
Niles,Calif. P1 .....4.85
SanFrancisco S7 .....5.10

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 ....5.925
Gary,Ind. U5 .....5.00
Houston S5 .....5.60
KansasCity S5 .....5.60
Youngstown U5 .....5.00

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....5.20
BeaverFalls,Pa. M12,R2.5.20
Buffalo B5 .....5.25
Camden,N.J. P13 .....5.65
Carnegie,Pa. C12 .....5.20
Chicago W18 .....5.20
Cleveland A7, C20 ....5.20
Detroit P17, R7 .....5.35
Detroit B5 .....5.40
Donora,Pa. A7 .....5.20
Elyria,O. W8 .....5.20
FranklinPark,Ill. N5 ....5.20
Gary,Ind. R2 .....5.20
GreenBay,Wis. F7 .....5.20
Hammond,Ind. L2, M13.5.20
Hartford,Conn. R2 .....5.75
Harvey,Ill. B5 .....5.20
LosAngeles R2, S30 ....6.65
Mansfield,Mass. B5 ....5.75
Massillon,O. R2, R8 ...5.20
Monaca,Pa. S17 .....5.20
Newark,N.J. W18 .....5.65
NewCastle,Pa.(17) B4 .5.20
Pittsburgh J5 .....5.20
Plymouth,Mich. P5 ....5.45
Putnam,Conn. W18 .....5.75
Readville,Mass. C14 ....5.75
St.Louis,Mo. M5 .....5.50
So.Chicago,Ill. W14 ....5.20
SpringCity,Pa. K3 .....5.65
Struthers,O. Y1 .....5.20
Waukegan,Ill. A7 .....5.20
Worcester,Mass. W19 ...6.10
Youngstown F3, Y1 ....5.20

BARS, Cold-Finished Alloy (Turned and Ground)
Cumberland,Md.(5) C19.4.45

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....6.325
BeaverFalls,Pa. M12 ..6.325
Bethlehem,Pa. B2 .....6.325
Buffalo B5 .....6.325
Camden,N.J. P13 .....6.50
Canton,O. R2, T7 ....6.325
Carnegie,Pa. C12 .....6.325
Chicago W18 .....6.325
Cleveland A7, C20 ....6.325
Detroit R7 .....6.425
Detroit P17 .....6.475
Detroit B5 .....6.525
Donora,Pa. A7 .....6.325
Elyria,O. W8 .....6.325
Gary,Ind. R2 .....6.325
Hammond,Ind. L2,M13.6.325
Hartford,Conn. R2 ....6.775
Harvey,Ill. B5 .....6.325
Lackawanna,N.Y. B2 ..6.325
Mansfield,Mass B5 ....6.775
Massillon,O. R2, R8 ...6.325
Midland,Pa. C18 .....6.325
Monaca,Pa. S17 .....6.325
Newark,N.J. W18 .....6.65
Plymouth,Mich. P5 ....6.525
So.Chicago,Ill. R2,W14.6.325
SpringCity,Pa. K3 ....6.50
Struthers,O. Y1 .....6.325
Warren,O. C17 .....6.325
Waukegan,Ill. A7 .....6.325
Worcester,Mass. A7 ...6.625
Youngstown F3, Y1 ..6.325

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..4.15
Atlanta A11 .....4.35
Birmingham,Ala C15 ..4.15
Buffalo R2 .....4.15
Cleveland R2 .....4.15
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 ....4.85
Gary,Ind. U5 .....4.15
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1.4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.75
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.85
Pittsburg,Calif. C11 ....4.85
Pittsburgh J5 .....4.15
SandSprings,Okla. S5 ..5.00
Seattle B3, N14, P23....4.90
So.Chicago,Ill. R2 .....4.15
So.Duquesne,Pa. U5 ....4.15
So.SanFrancisco B3 ....4.90
SparrowsPoint,Md. B2 ..4.15
Sterling,Ill.(1) N15 ....4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Youngstown R2, U5 ....4.15

BARS, Reinforcing (Fabricated; to consumers)
Johnstown, ¼-1" B2 ...5.55
KansasCity S5 .....6.35
LosAngeles B3 .....5.80
Marion,O. P11 .....5.55
Seattle N14 .....5.80
Seattle B3, P23 .....5.85
So.SanFrancisco B3 ....5.85
SparrowsPt, ¼-1" B2 ...5.55
Williamsport,Pa. S19 ...5.45

RAIL STEEL BARS
Avis,Pa.(3) J8 .....4.25
ChicagoHts.(3) C2, I-2..4.05
ChicagoHts.(4) C2, I-2..4.15
Ft.Worth,Tex.(26) T4 ...4.65
Franklin,Pa.(3) F5 ....4.05
Franklin,Pa.(4) F5 ....4.15
Marion,O.(3) P11 .....4.00
Moline,Ill.(3) R2 .....4.15
Tonawanda(3,4) B12 ...4.15
Williamsport,Pa.(3) S19.4.25
Williamsport,Pa.(4) S19.5.45

BARS, Wrought Iron
Economy,Pa.(S.R.)B14 10.40
Economy,Pa.(D.R.)B14 12.90
Economy(Staybolt) B14 13.20
McK.Rks.(S.R.) L5 ...10.40
McK.Rks.(D.R.) L5 ...14.00
McK.Rks(Staybolt) L5.15.50

SHEETS

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..3.925
Allenport,Pa. P7 .....3.925
Ashland,Ky.(8) A10 ...3.925
Cleveland J5, R2 .....3.925
Conshohocken,Pa. A3 ..3.975
Detroit M1 4.075
Ecorse,Mich. G5 4.075
Fairfield,Ala. T2 .....3.925
Fairless,Pa. U5 .....3.975
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
Geneva,Utah C11 .....4.025
GraniteCity,Ill. G4 ....4.125
Ind.Harbor,Ind. I-2, Y1.3.925
Irvin,Pa. U5 .....3.925

Kokomo,Ind. C16 ....4.025
Lackawanna,N.Y. B2 .3.925
Munhall,Pa. U5 ....3.925
Newport,Ky. N9 ....3.925
Niles,O. N12 .....5.175
Pittsburg,Calif. C11 ...4.625
Pittsburgh J5 .....3.925
Portsmouth,O. P12 ....3.925
Riverdale,Ill. A1 ....3.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
SparrowsPoint,Md. B2.3.925
Steubenville,O. W10 ...3.925
Torrance,Calif. C11 ...4.625
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....3.925
Youngstown U5, Y1 ...3.925

SHEETS H.R. (19 gage)
AlabamaCity,Ala. R2 ..5.225
Dover,O. R1 .....5.05
Kokomo,Ind. C16 ....5.025
Mansfield,O. E6 .....5.05
Niles,O. N12 .....4.775
Torrance,Calif. C11 ....5.875

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy
Cleveland J5, R2 .....5.90
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 ..... 6.05
Fairfield,Ala. T2 .....5.90
Fairless,Pa. U5 .....5.95
Fontana,Calif. K1 ....6.675
Gary,Ind. U5 .....5.90
Ind.Harbor,Ind. I-2 ....5.90
Ind.Harbor,Ind. Y1 ....6.40
Irvin,Pa. U5 .....5.90
Lackawanna(35) B2 ...5.90
Munhall,Pa. U5 .....5.90
Pittsburgh J5 .....5.90
Sharon,Pa. S3 .....5.90
So.Chicago,Ill. U5 ....5.90
SparrowsPoint(36) B2 ..5.90
Warren,O. R2 .....5.90
Weirton,W.Va. W6 ....5.90
Youngstown U5 .....5.90
Youngstown Y1 .....6.40

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)
Ashland,Ky.(8) A10 ..4.175
Cleveland R2 .....4.525
Ind.Harbor, Ind. I-2 ...4.175
Warren,O. R2 .....4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)
Allenport,Pa. P7 .....4.775
Cleveland J5, R2 .....4.775
Ecorse,Mich. G5 ..... 4.925
Fairfield,Ala. T2 .....4.775
Fairless,Pa. U5 .....4.825
Follansbee,W.Va. F4 ..4.775
Fontana,Calif. K1 ....5.875
Gary,Ind. U5 .....4.775
GraniteCity,Ill. G4 ....4.975
Ind.Harbor,Ind I-2,Y1.4.775
Irvin,Pa. U5 .....4.775
Lackawanna,N.Y. B2. .4.775
Middletown,O. A10 ....4.775
Pittsburg,Calif. C11 ...5.725
Pittsburgh J5 .....4.775
Portsmouth,O. P12 ....4.775
SparrowsPoint,Md. B2..4.775
Steubenville,O. W10 ...4.775
Warren,O. R2 .....4.775
Weirton,W.Va. W6 ....4.775
Youngstown Y1 .....4.775

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 .....7.225
Ecorse,Mich. G5 ..... 7.375
Fairless,Pa. U5 .....7.275
Fontana,Calif. K1 ....8.275
Gary,Ind. U5 .....7.225
IndianaHarbor,Ind. Y1.7.725
Irvin,Pa. U5 .....7.225
Lackawanna(37) B2 ..7.225
Pittsburgh J5 .....7.225
SparrowsPoint (38) B2.7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225
Youngstown Y1 .....7.725

SHEETS, Cold-Rolled Ingot Iron
Cleveland R2 .....5.375
Middletown,O. A10 ....5.275
Warren,O. R2 .....5.375

SHEETS, Culvert

	Cu	Cu
	Alloy	Fe
Ashland,Ky A10	.6.325	...
Canton,O. R2	..6.075	6.675
Fairfield T2	....6.075	6.325
Gary,Ind. U5	..6.075	6.325
Ind.Harbor I-2	..6.075	6.325
Irvin,Pa. U5	...6.075	6.325
Kokomo,Ind. C16	6.175	....
MartinsFry.,O W10	6.075	....
Pitts.,Calif. C11	..6.825	....
SparrowsPt. B2	..6.075	....
Torrance,Cal. C11	7.075	....

SHEETS, Culvert

	Pure Iron
Ashland,Ky. A10	....6.575
Fairfield,Ala. T2	.....6.325
MartinsFerry,O. W10	..6.325

SHEETS, Gal'd No. 10 Steel
AlabamaCity,Ala. R2 ..5.275
Ashland,Ky(8) A10 ...5.275
Canton,O. R2 .....5.275
Delphos,O. N16 .....5.775
Dover,O. R1 .....5.275
Fairfield,Ala. T2 ....5.275†
Gary,Ind. U5 .....5.275†
GraniteCity,Ill. G4 ....5.475
Ind.Harbor,Ind. I-2 ...5.275
Irvin,Pa. U5 .....5.275†
Kokomo,Ind. C16 ....5.375†
MartinsFerry,O. W10..5.275
Niles,O N12 .....5.275
Pittsburg,Calif. C11 ..6.025†
SparrowsPoint,Md. B2.5.275
Steubenville,O. W10 ..5.275
Torrance,Calif. C11 ...6.275†
Weirton,W.Va. W6 ....5.275

† Based on 5c zinc

SHEETS, Galvanized No. 10 High-Strength Low-Alloy
Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2..8.075

SHEETS, Galvanized Ingot Iron No. 10 flat
Ashland,Ky.(8) A10 ...5.525
Canton,O. R2 .....6.025

SHEETS, Galvannealed Steel
Canton,O. R2 .....5.825
Irvin,Pa. U5 .....5.825†
Kokomo,Ind. C16 ....5.925†
Niles,O. N12 .....5.825

† Based on 5c zinc

SHEETS ZINCGRIP Steel
Butler,Pa. A10 ..... 5.275
Middletown,O. A10 ..... 5.275

SHEETS, ZINCGRIP Ingot Iron
Butler,Pa. A10 ..... 5.575
Middletown,O. A10 ..... 5.575

SHEETS, Electrogalvanized
Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED
Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron
Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill. G4 ....5.375
Ind.Harbor,Ind. I-2 ...5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10 ....5.175
Niles,O. N12 .....6.525
Youngstown Y1 .....5.175

BLUED STOCK, 29 ga.
Follansbee,W.Va. F4 ..7.30
Follansbee(23) F4 ....7.175
Yorkville,O. W10 .....7.20

SHEETS, Long Terne Steel (Commercial Quality)
BeechBott'm,W.Va.W10 5.675
Gary,Ind. U5 .....5.675
Mansfield,O. E6 .....5.675
Middletown,O. A10 ....5.675
Niles,O. N12 .....5.675
Weirton,W.Va. W6 ....5.675

SHEETS, Long Terne, Ingot Iron
Middletown,O. A10 ....6.075

SHEETS, Well Casing
Fontana,Calif. K1 ....6.20

STRIP

STRIP, Hot-Rolled Carbon
Ala.City,Ala.(27) R2 ..3.925
Allenport,Pa. P7 .....3.925
Alton,Ill. L1 .....4.10
Ashland,Ky(8) A10 ....3.925
Atlanta A11 .....4.125
Bessemer,Ala. T2 .....3.925
Birmingham C15 .....3.925
Bridgeport,Conn.(10)S15 3.95
Buffalo(27) R2 .....3.925
Carnegie,Pa. S18 .....4.425
Conshohocken,Pa. A3 ..4.05
Detroit M1 ..... 4.075
Ecorse,Mich. G5 ..... 4.075
Fairfield,Ala. T2 .....3.925
Fontana,Calif. K1 ....4.70
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.325
Ind.Harbor,Ind. I-2,Y1.3.925
Johnstown,Pa.(25) B2..3.925
KansasCity,Mo.(9) S5..4.525
Lackw'na,N.Y.(25) B2.3.925
LosAngeles(25) B3 ....4.675
Milton,Pa. M18 .....3.925
Minnequa,Colo. C10 ...5.025
NewBritain(10) S15 ....4.15
N.Tonawanda,N.Y. B11.3.925
Pittsburg,Calif. C11 ...4.675
Portsmouth,O. P12 ....3.925
Riverdale,Ill A1 .....3.925
San Francisco S7 .....5.10
Seattle(25) B3, P23 ...4.925
Seattle N14 .....4.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
So.SanFrancisco(25)B3 4.675
SparrowsPoint,Md. B2.3.925
Torrance,Calif. C11 ...4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....3.925
Youngstown U5 .....3.925

STRIP, Hot-Rolled Alloy
Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.40
Fontana,Calif. K1 .....7.80
Gary,Ind. U5 .....6.40
Houston,Tex. S5 .....6.80
KansasCity,Mo. S5 ....7.00
LosAngeles B3 .....7.80
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.40
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

STRIP, Hot-Rolled High-Strength Low-Alloy
Bessemer,Ala. T2 .....5.95
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 ..... 6.10
Fairfield,Ala. T2 .....5.95
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y-1 ....6.45
Lackawanna,N.Y. B2 ..6.00
LosAngeles(25) B3 ....6.70
Seattle(25) B3, P23 ....6.95
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25) B3.6.70
SparrowsPoint,Md. B2 ..6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6 ....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

STRIP, Hot-Rolled Ingot Iron
Ashland,Ky.(8) A10 ..4.175
Warren,O. R2 .....4.525

STRIP, Cold-Rolled Carbon
Anderson,Ind. G5 .....5.45
Bridgeprt,Conn.(10) S15.5.45
Cleveland A7, J5 .....5.45
Dearborn,Mich. D5 ..... 5.60
Detroit M1 ..... 5.60
Detroit D2, P20 .....5.65
Dover,O. G6 .....5.45
Ecorse,Mich. G5 ..... 5.60
Follansbee,W.Va. F4 ..5.45
Fontana,Calif. K1 .....7.35
FranklinPark,Ill. T6 ..5.70
Ind.Harbor,Ind. I-2 ....5.70
Indianapolis C8 .....5.60
Lackawanna,N.Y. B2 ..5.45
LosAngeles C1 .....7.50
Mattapan,Mass. T6 ....6.10
Middletown,O. A10 ....5.45
NewBedford,Mass. R10..6.00
NewBritain(10) S15 ....5.45
NewCastle,Pa. B4, E5..5.45
NewHaven,Conn. A7 ...6.20
NewHaven,Conn. D2 ...5.90
Pawtucket,R.I. N8, R3..6.10
Pittsburgh J5 .....5.45
Riverdale,Ill. A1 .....5.70
Rome,N.Y.(32) R6 ....5.45
Sharon,Pa. S3 .....5.45
SparrowsPoint,Md. B2..5.45
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2 ....5.90
Warren,O.(40) T5 .....5.45
Warren,O. B9, R2 .....5.45
Weirton,W.Va. W6 ....5.45
Worcester,Mass. A7 ....6.30
Youngstown C8, Y1 ....5.45

STRIP, Cold-Rolled Alloy Steel
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O. G6 .....12.00
Fontana,Calif. K1 .....13.65
Harrison,N.J. C18 .....12.00
Pawtucket,R.I.(11) N8..12.15
Pawtucket,R.I.(12) N8..12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ...12.30
Youngstown C8 .....12.00

STRIP, Cold-Rolled High-Strength Low-Alloy
Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich. D3 ....7.90
Dover,O. G6 .....8.00
Ecorse,Mich. G5 ..... 8.30
Lackawanna,N.Y. B2 ..8.15
Pittsburgh J5 .....7.80
Sharon,Pa. S3 .....7.65
SparrowsPoint,Md. B2..8.15
Warren,O. R2 .....7.60
Weirton,W.Va. W6 ....8.15
Youngstown Y1 .....8.30

STRIP, Cold-Rolled Ingot Iron
Warren,O. R2 .....6.05

STRIP, Electrogalvanized
Dover,O. G6 .....5.45
Warren,O. B9, T5 .....5.45
Weirton,W.Va. W6 ....5.45
Youngstown C8 .....5.70

TIGHT COOPERAGE HOOP
Atlanta A11 .....4.65
Riverdale,Ill. A1 .....4.50
Sharon,Pa. S3 .....4.35
Youngstown U5 .....4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div, H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.
C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.
E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.
G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
H7 Helical Tube Co.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel&Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod. Steel Strip Corp.
P23 Pacific Steel Rolling
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel
Y1 Youngstown Sheet&Tube

STRIP, Cold-Finished	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Spring Steel (Annealed)					
Bridgeport,Conn.(10) S15	5.45	7.65	8.60	10.55	12.85
Bristol,Conn. W1	...	...	8.90	10.85	....
Carnegie,Pa. S18	...	7.65	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Cleveland,O. C7	...	8.00	8.60	10.55	12.85
Dearborn,Mich. D3	5.60	7.85	8.80	....	....
Detroit D2	5.65	7.85	8.80	10.55	....
Dover,O. G6	5.45	7.65	8.60	10.55	12.85
FranklinPark,Ill. T6	5.70	7.80	8.75	10.70	13.00
Harrison,N.J. C18	...	...	8.90	10.85	13.15
Indianapolis C8	...	7.80	8.60	10.55	....
Mattapan,Mass. T6	6.10	7.95	8.90	10.85	13.15
NewBritn.,Conn.(10) S15	5.75	7.65	8.60	10.55	12.85
NewCastle,Pa. B4	5.45	7.65	8.60	....	....
NewCastle,Pa. E5	5.45	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	5.90	7.95	8.90	10.85	....
NewYork W3	...	7.95	8.90	10.85	13.15
Pawtucket,R.I.(11) N8	...	7.65	8.60	10.55	12.85
Pawtucket,R.I.(12) N8	6.10	7.95	8.90	10.85	13.15
Sharon,Pa. S3	5.45	7.65	8.60	10.55	12.85
Trenton,N.J. R5	...	7.95	8.90	10.85	13.15
Wallingford,Conn. W2	5.90	7.95	8.90	10.85	13.15
Warren,O. T5	5.45	7.65	8.60	10.55	12.85
Weirton,W.Va. W6	5.45	7.65	8.60	10.55	12.85
Worcester,Mass. A7	6.30	7.95	8.90	10.85	13.15
Worcester,Mass. T6	6.10	7.95	8.90	10.85	13.15
Youngstown C8	...	7.65	8.60	10.55	12.85
Spring Steel (Tempered)					
Buffalo W12	...	...	12.50	....	....
Bristol,Conn. W1	...	...	12.50	15.00	....
FranklinPark,Ill. T6	...	...	13.25	15.75	18.75
Harrison,N.J. C18	...	...	12.50	15.00	18.00
NewYork W3	...	...	12.50	15.00	18.00
Trenton,N.J. R5	...	...	12.50	15.00	18.00
Worcester,Mass. T6	...	...	12.50	15.00	18.00
Worcester,Mass. W12	...	...	12.50	....	....
Youngstown C8	...	...	12.85	15.35	18.35

SILICON STEEL

H.R. SHEETS (22 gage) (Cut Lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	...	...	8.75	9.75	10.65
Brackenridge,Pa. A4	....	...	...	8.75	9.75	10.65
IndianaHarbor,Ind. I-2	....	7.85	8.15	8.75	9.75	....
Mansfield,O. E6	....	7.85	8.15	8.75	9.75	10.65
Newport,Ky. N9	....	7.85	8.15	8.75	9.75	10.65
Niles,O. N12	....	7.85	8.15	8.75	9.75	....
Vandergrift,Pa. U5	....	...	8.15	8.75	9.75	10.65
Warren,O. R2	....	7.85	8.15	8.75	9.75	....
Zanesville, O. A10	....	...	8.15	8.75	9.75	10.65

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
GraniteCity,Ill. G4	8.25*	8.60*	9.20*	10.20*	....
IndianaHarbor,Ind. I-2	8.05	8.40*	9.00*	....	....
Vandergrift,Pa. U5	8.05*	8.90	9.50	10.50	11.40
Warren,O. R2	8.05†	8.90	9.50	10.50	11.40

H.R. SHEETS (22 Gage) (Cut Lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.60	12.15	12.65	13.65
Brackenridge,Pa. A4	11.60	....	....	....
Newport,Ky. N9	11.60	....	....	....
Vandergrift,Pa. U5	11.60	12.15	12.65	13.65
Zanesville,O. A10	11.60	12.15	12.65	13.65

C.R. COILS & CUT LENGTHS (22 Ga.)	T-100	T-90	T-80	T-73	T-72
Butler,Pa. A10	....	....	16.25	16.75	....
Vandergrift,Pa. U5	13.65	14.65	16.25	16.75	12.35‡
Warren,O. R2	....	....	....	....	12.35‡

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½c lower.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	8.95
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.10

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala. T2	$7.65
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)	
Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb	
Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind. U5	9.75

WIRE

WIRE, Manufacturers Bright, Low Carbon	
AlabamaCity,Ala. R2	5.525
Aliquippa,Pa. J5	5.525
Alton,Ill. L1	5.70
Atlanta A11	5.725
Bartonville,Ill. K4	5.625
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20, R2	5.525
Crawfordsville,Ind. M8	5.625
Donora,Pa. A7	5.525
Duluth,Minn. A7	5.525
Fairfield,Ala. T2	5.525
Fostoria,O. (24) S1	5.75
Houston S5	5.925
Jacksonville,Fla. M8	6.05
Johnstown,Pa. B2	5.525
Joliet,Ill. A7	5.525
KansasCity,Mo. S5	6.125
Kokomo,Ind. C16	5.625
LosAngeles B3	6.475
Minnequa,Colo. C10	5.775
Monessen,Pa. P7	5.525
No.Tonawanda B11	5.525
Palmer,Mass. W12	5.825
Pittsburg,Calif. C11	6.475
Portsmouth,O. P12	5.525
Rankin,Pa. A7	5.525
So.Chicago,Ill. R2	5.525
So.SanFrancisco C10	6.475
SparrowsPoint,Md. B2	5.625
Sterling,Ill.(1) N15	5.525
Struthers,O. Y1	5.525
Waukegan,Ill. A7	5.525
Worcester,Mass. A7	5.825

WIRE, MB Spring, High Carbon	
Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.10
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa. B2	6.925
LosAngeles B3	7.875
Millbury,Mass.(12) N6	7.225
Minnequa,Colo. C10	7.175
Monessen,Pa. P7, P16	6.925
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Portsmouth,O. P12	6.925
Roebling,N.J. R5	7.225
So.Chicago,Ill. R2	6.925
So.SanFran. C10	7.875
SparrowsPt.,Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	6.625
Alton,Ill. L1	6.80
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
LosAngeles B3	7.575
Minnequa,Colo. C10	6.80
Monessen,Pa. P7, P16	6.625
NewHaven,Conn. A7	6.925
Palmer,Mass. W12	6.925
Pittsburg,Calif. C11	7.575
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.625
So.SanFrancisco C10	7.575
SparrowsPoint,Md. B2	6.725
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving (8" Coils)	
Alton,Ill. L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawfordsville,Ind. M8	10.65
Fostoria,O. S1	10.55
Jacksonville,Fla. M8	11.08
Johnstown,Pa. B2	10.55
Kokomo,Ind. C16	10.55
Minnequa,Colo. C10	10.30
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Roebling,N.J. R5	10.85
So.SanFrancisco C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7,T6,10	10.75

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill. K4	9.50
Buffalo W12	9.50
Johnstown,Pa. B2	9.50
Minnequa,Colo. C10	9.625
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Portsmouth,O. D2	9.50
Roebling,N.J. R5	9.80
SparrowsPt.,Md. B2	9.60

ROPE WIRE (A)	
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P7, P16	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass. W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt. B2	9.45
Struthers,O. Y1	9.35
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead	
Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.55
Roebling,N.J. R5	12.85

WIRE, Cold-Rolled Flat	
Anderson,Ind. G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville,Ind. M8	7.55
Dover,O. G6	7.45
Fostoria,O. S1	7.45
Kokomo,Ind. C16	7.55
FranklinPark,Ill. T6	7.60
Massillon,O. R8	7.45
Monessen,Pa. P7, P16	7.45
Pawtkt.,R.I.(12) N8	7.75
Trenton,N.J. R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld. Galv.
Ala.City R2	6.675 7.075**
Aliquippa J5	6.675 7.20*
Atlanta A11	6.775 7.30
Bartonville(48)K4	6.775 7.275
Buffalo W12	6.675 7.075†
Cleveland A7	6.675 ....
Crawfordsville M8	6.775 7.30
Donora,Pa. A7	6.675 7.075†
Duluth,Minn. A7	6.675 7.075†
Fairfield T2	6.675 7.075†
Houston,Tex. S5	7.075 7.475
Jacksonville,Fla. M8	7.20 7.73
JohnstownB2(48)	6.675 7.225*
Joliet,Ill. A7	6.675 7.075†
KansasCity,Mo. S5	7.275 7.675
Kokomo C16	6.775 7.175†
LosAngeles B3	7.625 ....
Minnequa C10	6.925 7.325**
Monessen P7(48)	6.675 7.225
Palmer W12	6.975 7.375†
Pitts.,Calif. C11	7.625 8.025†
Portsmouth,O. P12	6.675 ....
Rankin A7	6.675 7.075†
So.Chi'go R2	6.675 7.075**
S.S.Frn.(48)	C10 7.625 8.025**
Spar'wsPt.B2(48)	6.775 7.325*
Steri'g(1)(48)	N15 6.675 7.20
Struthers,O.	Y1..6.675 7.175
Worcester A7	6.975 ....

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga. Col.	
Ala.City,Ala. R2	140**
Ala.City, 17 ga. R2	235**
Ala.City, 18 ga. R2	245**
Aliq'ppa,Pa.9-14½ga. J5	143*
Atlanta A11	145
Bartonville,Ill. K4	144
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17 ga.,6"B2	234
Johnstown 4" B2	237
Joliet,Ill. A7	140†
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142†
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	140**
Sterling,Ill. (1) N15	143

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	149
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
KansasCity,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	173
So.Chicago,Ill. R2	149
So.SanFran.,Calif. C10	173
SparrowsPoint,Md. B2	151
Sterling,Ill.(1) N15	149

WIRE, Barbed	Col.
AlabamaCity R2	153**
Aliquippa J5	150*
Atlanta A11	158
Bartonville,Ill. K4	157
Crawfordsville,Ind. M8	158
Donora,Pa. A7	153†
Duluth,Minn. A7	153†
Fairfield,Ala. T2	153†
Houston,Tex. S5	161
Johnstown,Pa. B2	156*
Joliet,Ill. A7	153†
KansasCity,Mo. S5	165
Kokomo,Ind. C16	156†
Minnequa,Colo. C10	159**
Monessen,Pa. P7	157
Pittsburg,Calif. C11	173†
Rankin,Pa. A7	153†
So.Chicago,Ill. R2	153**
S.SanFrancisco C10	176**
SparrowsPoint,Md. B2	158*
Sterling,Ill. (1) N15	156

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

WIRE (16 gage)	An'ld. Stone	Galv. Stone
Ala.City R2	12.50	14.05**
Aliquippa J5	12.50	14.30*
Bartonville K4	12.60	14.35
Buffalo W12	12.50	....
Cleveland A7	12.50	....
CrawfordsvilleM8	12.50	14.30
Fostoria,O. S1	12.60	14.15
Johnstown B2	12.50	14.35*
Kokomo C16	12.60	14.15†
Minnequa C10	12.75	14.45**
Palmer,Mas.W12	12.50	14.05†
Pitts.,Calif. C11	12.85	14.40†
SparrowsPt. B2	12.60	14.45*
Sterling(1) N15	12.50	14.30
Waukegan A7	12.50	14.05†
Worcester A7	12.80	....

* Based on 11c zinc; † 5c zinc; ** Subject to zinc equalization extras.

NAILS, Stock To dealers & mfrs. (7)	Col.
Alabama City,Ala. R2	131
Aliquippa,Pa. J5	131
Atlanta A11	133
Bartonville,Ill. K4	133
Chicago,Ill. W13	131
Cleveland A9	137
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Galveston,Tex. D7	139
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	136
Monessen,Pa. P7	131
Pittsburg,Calif. C11	150
Rankin,Pa. A7	131
So.Chicago,Ill. R2	131
SparrowsPt.,Md. B2	133
Sterling,Ill. (1) N15	131
Worcester,Mass. A7	137

NAILS, CUT (100 lb keg) To dealers (33)	
Conshohocken,Pa. A3	$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	133
Aliquippa,Pa. J5	133
Atlanta A11	135
Bartonville,Ill. K4	135
Crawfordsville,Ind. M8	135
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Johnstown,Pa. B2	133
Joliet,Ill. A7	133
Kokomo,Ind. C16	135
Minnequa,Colo. C10	138
Monessen,Pa. P7	133
Pittsburg,Calif. C11	152
Rankin,Pa. A7	133
So.Chicago,Ill. R2	133
SparrowsPt.,Md. B2	135
Sterling,Ill. (1) N15	133
Worcester,Mass. A7	139

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2 I-2	145
Duluth,Minn. A7 (49)	145
Franklin,Pa. F5	145
Johnstown,Pa. B2	145
Marion,O. P11	145
Minnequa,Colo. C10	150
Moline,Ill. R2	145
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	146
Williamsport,Pa. S19	148

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
Ambridge, Pa. N2 (†)	15.75	...	19.75	...	22.25	...	23.75	...	23.75	...	23	...	25.5	....
Lorain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	23	8.75	25.5	11.25
Youngstown Y1 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	15.75	1.5	19.75	3.5	22.25	6.0	23.75	7.5	23.75	7.5	23	7.5	25.5	6.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	¼		⅜		½		¾		1		1¼		1½	
List Per Ft	5.5c		6c		8c		11.5c		17c		23c		27.5c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	...	...	....	...	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Alton, Ill. L1 (§)	...	...	....	...	....	....	24.25	9	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25
Benwood, W. Va. W10(††)	25.5	+0.25	17.75	+5.5	10.25	+10	26.25	11	29.25	15	31.75	18.5	34.25	19.5	34.75	20.25
Butler, Pa. F6	26.5	—1.75	19.5	+2.75	12.5	+6.25	....	..	....	..	....	....	....	....	....	....
Etna, Pa. N2 (†)	...	...	....	...	....	....	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25
Fairless, Pa. N3	...	...	....	...	....	....	24.25	..	27.25	..	29.75	...	32.25	....	32.75	....
Fontana, Calif. K1 (§)	...	...	....	...	....	....	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
Ind. Harbor Y1 (††)	...	...	....	...	....	....	25.25	−9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
Lorain, O. N3 (*)	...	...	....	...	....	....	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
Sharon, Pa. S4 (‡)	26.5	—0.25	19.50	+4.25	12.5	+8.5	....	..	....	..	....	....	....	....	....	....
Sharon, Pa. M6	...	...	....	...	....	....	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
Sparrows Pt., Md. B2 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
Youngstown R2 (**)	...	...	....	...	....	....	26.25	12	29.25	16	31.75	19.5	34.25	20.0	34.75	21.0
Youngstown Y1 (††)	...	...	....	...	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Wheatland, Pa. W9 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5

Size—Inches	2		2½		3		3½		4	
List Per Ft	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....
Alton, Ill. L1 (§)	33.25	18.75	34.75	18	34.75	18	....	....	....	....
Benwood, W. Va. W10(††)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Etna, Pa. N2 (†)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
Fairless, Pa. N3	33.25	....	34.75	....	34.75	....	25.75	....	25.75	....
Fontana, Calif. K1 (§)	22.25	7	23.75	7	23.75	7	....	....	....	....
Ind. Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19	....	....	....	....
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	....	....	....	....
Sharon, Pa. M6	35.25	20.75	36.75	20.5	36.75	20.5	....	....	....	....
Sparrows Pt., Md. B2 (§)	32.25	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
Youngstown R2 (**)	35.25	21.5	36.75	21.0	36.75	21.0	27.75	11.5	27.75	11.5
Youngstown Y1 (††)	35.25	20	36.75	20	36.75	20	....	....	....	....
Wheatland, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*), 5c; (§), 10c to under 11c; (††), 10.50c-11.50c; (**), 9.50c; with discounts adjusted on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollar per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.02	18.44
1¼	13	....	22.53	18.12
1½	13	20.65	24.91	20.01
1¾	13	24.40	29.43	23.66
2	13	27.34	32.98	26.51
2¼	13	30.80	37.15	29.86
2½	12	33.43	40.32	32.41
2½	12	36.82	44.41	35.70
2¾	12	39.87	48.09	38.66
3	12	42.52	51.28	41.23

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	4.325	4.225	4.275	5.20
Ensley,Ala. T2	4.325	4.225	....	5.20
Fairfield,Ala. T2	...	...	...	5.20
Gary, Ind. U5	4.325	4.225	4.275	...
Huntington,W.Va. W7	...	...	...	(16)5.20
IndianaHarbor,Ind. I-2	4.325	4.225	4.275	...
Johnstown,Pa. B2	...	...	...	(16)5.20
Lackawanna,N.Y. B2	4.325	4.225	....	5.20
Minnequa,Colo. C10	4.325	4.225	....	5.70
Steelton,Pa. B2	4.325	4.225	....	...
Williamsport,Pa. S19	....	....	....	5.20

TIE PLATES

Fairfield,Ala. T2	5.125
Gary,Ind. U5	5.125
Ind.Harbor,Ind. I-2	5.125
Lackawanna,N.Y. B2	5.125
Minnequa,Colo. C10	5.125
Pittsburg,Calif. C11	5.275
Seattle B3	5.275
Steelton,Pa. B2	5.125
Torrance,Calif. C11	5.275

TRACK BOLTS (20) Treated

Cleveland R2	11.00
KansasCity,Mo. S5	11.00
Lebanon,Pa. B2	11.00
Minnequa,Colo. C10	11.00
Pittsburgh O3, P14	11.00
Seattle,Wash. B3	11.50

JOINT BARS

Bessemer,Pa. U5	5.275
Fairfield,Ala. T2	5.275
Ind.Harbor,Ind. I-2	5.275
Joliet,Ill. U5	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Steelton,Pa. B2	5.275

AXLES

Ind.Harbor,Ind. S13	6.50
Johnstown,Pa. B2	6.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.05
Ind.Harbor,Ind. I-2, Y1	7.05
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.05
Minnequa,Colo. C10	7.05
Pittsburgh J5	7.05
Seattle B3	7.55
So.Chicago,Ill. R2	7.05
Struthers,O. Y1	7.05
Youngstown R2	7.05

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger	8.90c
⅞-in. under	26.5 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	4
⅝-in. & ⅝-in.	5
¾-in. and larger	3
Longer than 6 in.:	
All diams.	+4
Lag bolts, all diams.:	
6 in. and shorter	12
Over 6 in. long	8
Ribbed Necked Carriage	5
Blank	25
Plow	25
Step, Elevator, Tap and Sleigh Shoe	12
Tire Bolts	List
Boiler & Fitting-Up Bolts	23

NUTS

H.P. & C.P., regular & heavy:	
Square, all sizes	58
H.P., Hex, regular & heavy:	
¾" and smaller	58
⅞" to 1⅛", inclusive,	60
1¼" to 1½", inclusive	62
1⅝" and larger	58
C.P. Hex, regular & heavy:	
All sizes	58
Hot Galv. Nuts (all types):	
¾" and smaller	40
⅞" to 1⅛", inclusive,	43
Finished Hex Nuts:	
New standard, all sizes	58
Semifinished & Slotted Hex.:	
Regular and heavy, all sizes	58

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	47.5 x 10
Plated finishes	30 x 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	38
¾-in. through 1 in.	22
Longer than 6 in.:	
⅝-in. and smaller	20
¾-in. through 1 in.	7

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge Iron:	
98+% Fe, annealed	18.00
Unannealed	
Minus 100 mesh	14.50
Minus 35 mesh	10.50
Minus 20 mesh	10.00
Swedish, c.l.f. N.Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N. J., in bags	11.25
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	23.00
Annealed, 99.5% Fe.	42.50
Unannealed (99+% Fe)	36.50
Unannealed (99+% Fe) (minus 325 mesh)	53.50
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Atomized, 500 lb drums, frgt. allowed:	
Carlots	31.00
Ton lots	34.00
Antimony, 500 lb lots	32.00*
Brass, ¼-ton lots	28.75-37.50†
Bronze, ¼-ton lots	50.00-60.00‡
Copper:	
Electrolytic	13.50*
Reduced	13.50*
Lead	7.50*
Magnesium	54.00-56.00
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	89.50
Nickel-Silver, ¼-ton lots	44.00-49.00‡
Nickel-Silver, ¼-ton lots	46.75**
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	8.50*
Stainless Steel, 302	91.00
Tin	14.50*
Zinc, ¼-ton lots	15.00-28.75‡
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.95
Less than 1000 lb	5.10
Chromium, electrolytic 99.9% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Sn. **64% Cu, 18% Zn, 18% Sn.

Footnotes

(1) Chicago base.
(2) Angles, flat, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼" to 1 7/16"; 1 7/16" to 1 15/16" 4.58c; 1 15/16" to 7 5/16" 4.95c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.40c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.35c for H.S.-L.A.
(31) Base; deld. within mill county.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(48) 6-7 gage.
(49) T-post; deduct 2 cols for U-post.

STAINLESS STEEL MILL PRICES

(Representative prices cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L	....	....	36.75	....	....	42.75	45.25	54.25	49.00
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
316L	....	....	52.50	....	....	61.00	64.25	70.00	72.00
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	56.25	64.50	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00	55.50	54.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	33.75	38.25	53.00	39.50	40.75	59.75	71.00
501	....	....	14.00	14.50	21.25	16.00	18.25	30.50	29.00
502	....	....	15.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Agaloy Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%	Sheets, Copper Base Both Sides
302	....	31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	.....	144.00
316	32.60	37.70-42.75	42.75	....
318	37.00	42.20	.....	....
321	29.80	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60	.....	....
410	22.90	30.10	.....	....
430	22.90	30.10	.....	....
Inconel	41.23	54.18	.....	165.00
Nickel	37.50	50.90	.....	....
Monel	38.90	51.80	.....	....
Copper*	....	.....	46.00	....

	Strip, Carbon Base, Cold-Rolled 10%	Strip, Carbon Base, Cold-Rolled Both Sides	Strip, Carbon Base, Hot-Rolled 10%	Strip, Carbon Base, Hot-Rolled Both Sides
Copper*	27.85	35.85	24.00	32.25

* Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25	5% Cr Hot Work	0.39
Extra Carbon	0.30	W-Cr Hot Work	0.41
Special Carbon	0.355	V-Cr Hot Work	0.42-.43
Oil Hardening	0.37-.390	Hi-Carbon-Cr	0.665-.70

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	3.875
18.25	4.25	1	4.75	....	2.160-2.320
18	4	2	9	....	2.515
18	4	2	....	....	1.640
18	4	1	....	....	1.480
18	4	1	....	....	1.735
13.5	4	3	....	....	1.005-1.055
6.4	4.5	1.9	....	5	1.240
6	4	3	....	6	0.495
2	1.4	1.2	....	....	0.865-0.895
1.5	4	1	....	8.5	

Tool Steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON Gross Ton

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	....	....
Woodward,Ala. W15	52.38	52.88	56.50†	....
Cincinnati, del.	....	60.43	....	....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	....
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No. Tonawanda,N.Y. T9	....	56.50	57.00	....
Boston, del.	66.65	67.15	67.65	....
Rochester,N.Y., del.	59.02	59.52	60.02	....
Syracuse,N.Y., del.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, del.	58.17	58.67	58.67	59.17
Muskegon,Mich., del.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron,O., del. from Cleve.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
NewYork, del.	....	62.28	62.78	....
Newark, del.	61.02	61.52	62.02	62.52
Birdsboro, Pa. B10	58.00	58.50	....	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, del.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	....
Pittsburgh District				
NevilleIsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Ambridge, Aliquippa, del.	57.37	57.87	57.87	58.37
McKeesRocks, del.	57.04	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, del.	57.66	58.16	58.16	58.66
Verona,Trafford, del.	58.19	58.69	58.69	59.19
Brackenridge, del.	58.45	58.95	58.95	59.45
Bessemer, Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa. P7	56.00	....	....	....
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., del.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.75	61.25	61.75	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T3	....	....	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, del.	61.76	62.26	....	....

* Low phos. southern grade. † Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; and $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$67.00
Buffalo H1	68.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

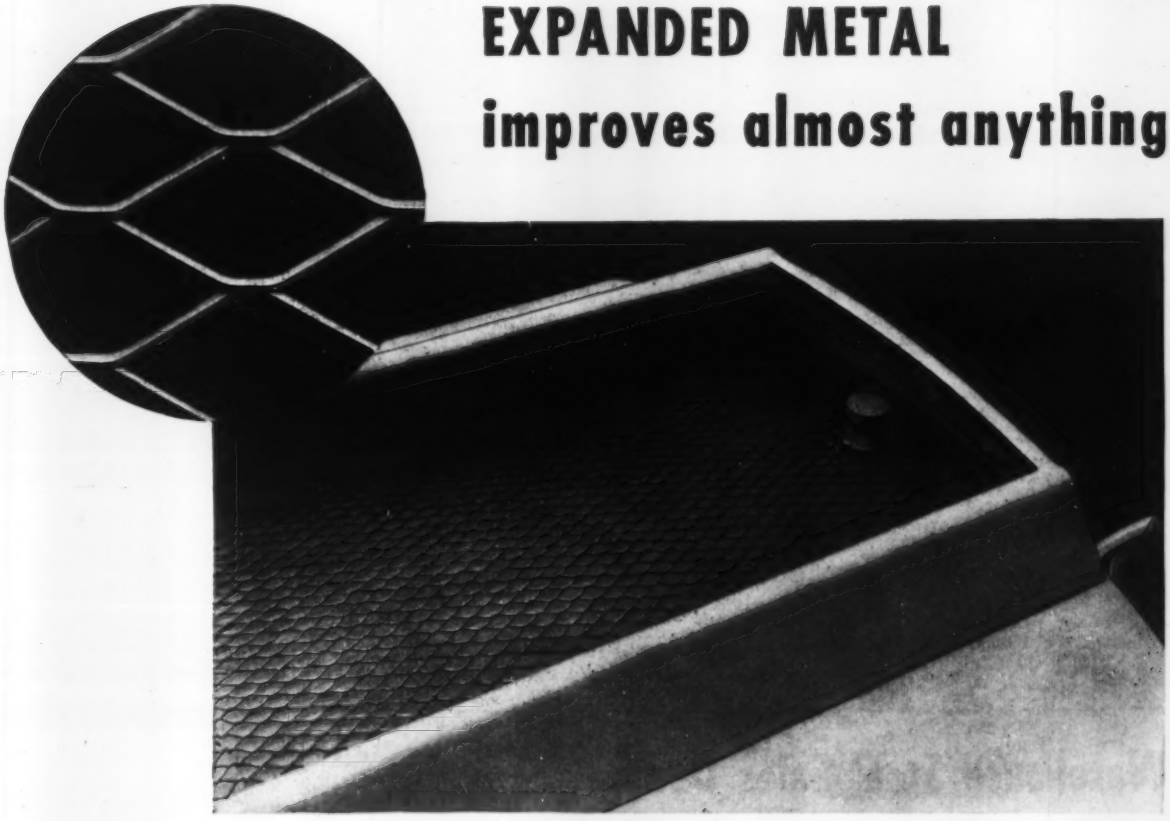
(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$87.50
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	92.00
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frgt, allowed K2	95.00
Wenatchee,Wash. OH & Fdry, freight allowed K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate A7	$61.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, del.	64.00
Troy,N.Y. R2	64.00

EXPANDED METAL
improves almost anything



FROM TANK TRAILERS TO TELEVISION ANTENNAS

Take a look around and notice how often you see Penmetal expanded metal in use, today, in modern products everywhere. It is literally *the material of a thousand uses.*

Why is this material rapidly becoming a sign of good design, good engineering? Because it is strong and rigid, yet light in weight and low in cost. Because it permits free passage of light and air, and has that smart, clean, attractive appearance that typifies modern trends in design.

Penmetal expanded metal is sheet metal that has been slit and expanded to as much as ten times its original width. Up to 80% lighter than solid sheet of the same dimensions, the diamond truss pattern adds rigidity and strength.

Available in corrosion-resistant metals as well as carbon steel; large or small mesh; light or heavy gauge. Easily formed, shaped and welded.

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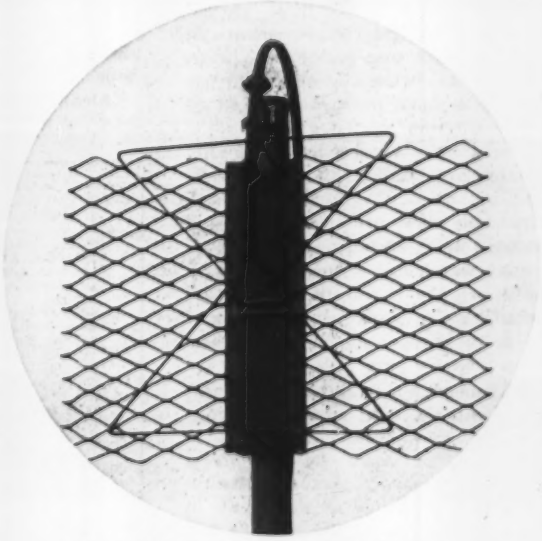

The tank trailer, made by Trailmobile, Inc., Cincinnati, Ohio, uses Penmetal expanded metal for walkway.

Penmetal expanded aluminum is used for the television antenna manufactured by The Radiart Corporation of Cleveland, Ohio.

PM-34

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Erie, St. Paul, 15 cents; Seattle and Spokane, Wash., no charge.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Baltimore	6.20	7.64	7.78	7.00	...	6.86	8.17[6]	12.04	6.98	6.85	7.98
Birmingham	6.10	7.00	8.00[2]	6.30	...	6.15	8.90	....	6.35	6.35	8.25
Boston	6.89	7.83	9.18	7.13	...	6.87	8.35	12.13	7.06	7.13	8.26
Buffalo	6.18	7.15	8.70	6.79	...	6.35	7.70	12.02	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.18	7.12	7.95	6.42	...	6.28	7.30	11.60	6.46	6.33	7.46
Cincinnati	6.30	7.11	8.20	6.66	...	6.52	7.60	11.85	6.64	6.62	7.71
Cleveland	6.18	7.12	7.90	6.58	...	6.34	7.40	11.74	6.79	6.50	7.63
Detroit	6.38	7.29	8.22	6.69	7.36	6.56	7.60	11.97	6.91	6.80	7.80
Erie, Pa.	6.15	...	8.15	6.45	...	6.23	7.50[6]	....	6.46	6.33	7.46
Houston	7.15	7.60	9.23	7.45	9.30	7.45	9.30	....	7.35	7.20	8.55
Los Angeles	7.25	9.00	8.60	7.55	11.20	7.15	9.10	13.10	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.12	6.59	...	6.45	7.57	11.77	6.63	6.50	7.63
Moline, Ill.	6.53	7.47	8.35	6.77	...	6.63	7.65	....	6.81	6.68	...
New York	6.78	7.52	8.37	7.16	...	7.06	8.43[6]	11.99	6.90	6.99	8.30
Norfolk, Va.	6.90	...	...	7.00	...	7.00	8.50	....	7.00	7.00	7.85
Philadelphia	6.35	7.13	7.87	7.02	8.80	6.87	8.19[6]	11.74	6.67	6.63	7.66**
Pittsburgh	6.18	7.12	8.00	6.55	...	6.28	7.65	11.60	6.46	6.33	7.46
Portland, Oreg.	7.90	8.45	9.15	7.65	...	7.35	10.65	....	7.25	7.30	9.15
Richmond, Va.	6.50	...	8.67	7.10	...	7.05	8.20	....	7.10	6.85	8.20
St. Louis	6.48	7.42	8.25	6.72	...	6.58	7.70	11.90	6.86	6.73	7.86
St. Paul	6.84	7.78	8.66	7.08	...	6.94	8.06	....	7.12	6.99	8.12
San Francisco	7.35	8.70	9.30	7.60	...	7.15	9.75	12.90	7.25	7.20	9.25
Seattle	8.15	9.50	9.80	8.00	...	7.60	10.65	13.50	7.50	7.60	9.40
Spokane	8.15	9.40[7]	9.80	7.60	...	7.60	10.55[8]	14.15	7.25	7.35	9.40
Washington	6.71	7.65	8.35	7.51	...	7.37	8.43	....	7.49	7.36	8.49

*Prices do not include gage extras; †prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded); ‡includes 35-cent special bar quality extra; §as rolled; **¼-in. and heavier, add 0.34c for 12 gage and lighter. ††as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb; [2]—500 to 9999 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 lb to 3999; [8]—under ½ in.

Warehouse Steel Sales Decline

Many distributors report April volume running 10 to 15 per cent below March tonnage and as much as 30 per cent from a year ago. Mills press for orders

Boston — Lack of tonnage sales hampers warehouses in liquidating heavy inventories on most carbon products. Slight improvement in April did not materialize with most warehouses, volume being off 10 per cent with some from March, and 30 per cent from April, 1953.

There are exceptions in highly competitive selling, but the slow working off of inventory is general. Especially slow are heavy bars and plates, also carbon sheets. This means warehouse orders placed with mills are the lowest in years. Distributors are banking on depletion of more burdensome stocks to balance level by July 1.

Philadelphia — Warehouse business has eased off, with latest indications pointing to a decline of around 15 per cent in April business from March. Moreover, leading distributors anticipate no improvement in May. In fact, one seller says he will consider himself lucky if volume holds at the April level. Reduction in rail freight rates a few weeks ago is reflected in a decline in warehouse prices on mechanical and welded carbon tubing and stainless pipe and tubing. No changes have been noted in prices on sheets, strip, bars and certain of the other more common grades as a result of rail rate revisions, although adjustments may come.

Chicago — Steel warehouses find little in their sales picture to give encouragement or discouragement for the future. Lower volume one week is followed by higher the next with the average continuing essentially unchanged. All demand can be accommodated comfortably.

Pittsburgh—Sales are leveling off, but distributors expect gains in May. Improving strength in the market is felt in rising sales of tool, agricultural and stainless steels. Warehouses are buying and selling small quantities of sheets, bars and tubular products.

Cleveland — Warehouses are actively canvassing customers for or-

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast*
Deformed Bars, Intermediate, ASTM-A-305	$4.55	$4.55	$4.50	$4.83
Bar Size Angles	4.40	4.40	4.35	4.68
Structural Angles	4.40	4.40	4.35	4.68
I-Beams	4.40	4.40	4.35	4.68
Wide Flange Beams	4.80	4.80	4.80	5.08
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.50	5.50	5.45	5.78
Furring Channels, C.R., 1000 ft, ⅝ x 0.30 lb per ft	25.50	25.70	25.50	26.34
Barbed Wire	6.60	6.60	6.60	6.68
Merchant Bars	4.55	4.55	4.50	4.83
Hot-Rolled Bands	4.70	4.70	4.65	4.98
Wire Rods, Thomas Commercial No. 5	4.77	4.84	4.82	5.09
Wire Rods, O-H, Cold Heading Quality No. 5	5.23	5.30	5.28	5.55
Bright Common Wire Nails, 8d	6.55	6.65	6.60	6.85

*Not including $2.20 per net ton customarily charged in most West Coast ports for wharfage and handling.

Size O.D.	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

ders but volume shows little change over recent weeks. Seasonal pickup in building steel is reported, but other lines of consumption continue to order sparingly. On the whole, while business is down from a year ago it still totals sizable volume and stacks up well with that entertained by the distributors in normal years.

Warehouse stocks are in the best shape they have been in years. As a result the distributors are not pressing the mills for shipments. At the same time, mill salesmen are pressing warehouses for orders on a scale not experienced in a decade or more.

Cincinnati—April lines up as a disappointing month to warehousemen. So long as prompt mill deliveries are offered, warehouses do not expect to see much of an improvement.

Los Angeles—Inquiries are more numerous over a broad range of steel products. For most distributors order volume in April was about 15 per cent under that of March, reversing an upward trend evident since January. Prices on galvanized sheets are down 75 cents to $8.60 per 100 pounds.

Seattle—Warehouse volume is increasing and the future looks promising. Buying is general out of stock, no item outstanding. Inventories are in good shape and warehouses are actively seeking new business. Prices continue stable in this area.

Tubular Goods . . .

Tubular Goods Prices, Page 157

Pittsburgh — Buttweld pipe sales are leveling off, as is demand for seamless tubes. Tubemakers say their customers are completing inventory adjustments. A drop in cancellations provides evidence of a balanced market.

Seattle—Sentiment is optimistic in the cast iron pipe market here as consumer interest is expanding with the advancing season.

Alloy Steel . . .

Cleveland—Pickup in demand for alloy steel is reported by Republic Steel Corp. As a result of improved orders the company has resumed operations at its Massillon, O. plant which had been closed down since Mar. 27. Three open hearths and the blooming mill have been put back into operation and 300 furloughed employees recalled.

At the same time, 350 workmen at the company's Canton, O. plant have been recalled over the past three weeks.

Revise Titanium Wire, Strip Prices

Producer effects adjustments as of Apr. 26, first change in schedules for these products in several years. Revisions in wire list slight, but strip is cut an average of 12 per cent

New York—Adjustments in prices on titanium strip and wire, effective on shipments beginning Apr. 26, are announced by the Titanium Metals Corp. of America.

For wire the adjustments represent no great change from past levels, but for strip, practically all the prices range downward, with an average reduction of about $2.75 per pound, or about 12 per cent.

These revisions are the first effected on these titanium products for several years, strip and wire not being involved in the recent flurry of price changes announced by producers.

The current changes are explained as due to better cost studies which place the company in position to adjust base prices and extras to better reflect manufacturing costs and yields.

New base prices and extras follow:

TITANIUM STRIP

Types: Cold-rolled commercially-pure and alloy grades.

Base Price: $15 per lb, f.o.b. West Leechburg, Pa., for Ti-75A and Ti-100A. $17.50 per lb, f.o.b. West Leechburg, Pa., for alloy grades.

Finish Extras:	Extra, $ per lb
No. 1 (cold-rolled, annealed and pickled)	Base
No. 2 (annealed, pickled and rerolled)	Base
Nos. 4, 6 and 7 finishes (cold-rolled, special polishing) in cut lengths, under 24" width may be priced on application.	

Edge Extras:	Extra, $ per lb
No. 1 (round or square edge rolled)	1.00
No. 3 (square slit edges)	Base
No. 5 (square rolled or filed after slitting)	0.75

Thickness and Width Extras for Cut Lengths: Add $0.50 per lb to applicable extra for coil stock.

Quantity Extra: Applicable to individual items of the same thickness and width ordered at one time for shipment at one time to one destination.

Ordering Weight in Pounds	Extra, $ per pound
10,000 and over	Base
5,000 to 9,999	0.50
1,000 to 4,999	1.00
500 to 999	1.50
100 to 499	2.00
1 to 99	3.00

TITANIUM WIRE

Types: Cold drawn commercially-pure and alloy grades.

Base Price: $11 per lb, f.o.b., Dunkirk, N. Y., for Ti-75A. Prices on request for alloy grades.

Finish Extras: Finish	Extra, $ per lb
Cold-drawn	Base
Centerless ground	1.00
Specially coated for cold heading	0.50
Polished	on request

When wire is shipped on spools a nominal charge will be made for spools. This charge will be rebated on the return of the spools to the mill in good condition.

Size Extras: Diameter ordering range in inches	Extra, $ per lb
Over 0.250 to 0.3125 (5/16")	2.75
Over 0.130 to 0.250	8.00
Over 0.070 to 0.130	12.00
Over 0.022 to 0.070	17.00
Over 0.010 to 0.022	28.00
Under 0.010	on request

Quantity Extras: Applicable to individual items of a grade and diameter ordered at one time for shipment at one time to one destination.

Ordering Weight in Pounds	Extra, $ per lb
10,000 and over	Base
5,000 to 9,999	0.50
1,000 to 4,999	1.00
500 to 999	1.50
100 to 499	2.00
1 to 99	3.00

Thickness & Width Extra for Coils:

Thickness in Inches (Ordering range)	Width in Inches	Extra, $ per lb
0.002 to 0.006 excl.	Less than 8	8.25
	8 and over	on request
0.006 to 0.010 excl.	Less than 8	6.75
	8 up to 20	7.25
	20 to 24 excl.	on request
0.010 to 0.016 excl.	Less than 8	5.75
	8 up to 20	5.25
	20 to 24 excl.	5.50
0.016 to 0.021 excl.	Less than 8	4.75
	8 up to 20	4.25
	20 to 24 excl.	4.50
0.021 to 0.026 excl.	Less than 8	3.75
	8 to 20	3.25
	20 to 24 excl.	3.50
0.026 to 0.033 excl.	Less than 8	3.00
	8 up to 20	2.50
	20 to 24 excl.	2.75
0.033 to 0.041 excl.	Less than 8	2.50
	8 up to 20	2.00
	20 to 24 excl.	2.25
0.041 to 0.061 excl.	Less than 8	2.00
	8 to 20	1.50
	20 to 24 excl.	1.75
0.061 to 0.126 excl.	Less than 8	1.50
	8 to 20	1.00
	20 to 24 excl.	1.25
0.126 to 0.187 incl.	Less than 8	1.00
	8 up to 20	0.50
	20 to 24 excl.	0.75

Moderate Pickup in Sheets Develops

Liquidation of consumers' inventories progressing. Rise in prompt shipment and fill-in orders reported by mills. Cautious buying expected over remainder of quarter

Sheet and Strip Prices, Page 154 & 155

Washington—Government services are buying more steel direct this quarter than during the first three months, also they are placing more contracts for flat-rolled fabricated products. Navy closes May 6 on 320 tons, hot-rolled carbon, pickled and oiled mill edge sheets. Substantial tonnages are also required for shelving, lockers and grain storage bins, the latter for storage of 100 million bushels. Deliveries starting May 15 are wanted. Large tonnage of galvanized is required.

Butler Mfg. Co., Galesburg, Ill., has the contract for 13,500 bins, more than $7 million. Galesburg plant will go on a 24-hour schedule. Ventilators and doors will be fabricated at Kansas City and shipped to Galesburg for assembly.

In addition to 13,500 bins of 3250-bushel capacity each awarded Butler Mfg. Co., contracts have also been given Black, Sivalls & Bryson, Kansas City, Mo., 4500 units; Western Engineering & Contracting Co., La Crosse, Wis., 875; Steel Co. of Ohio, Columbus, O., 2700. Contracts for larger bins, 41,160-bushel capacity, went to Great Lakes Steel Corp., Detroit, 450 units, and Dickinson-Leck Co., Bemidji, Minn., 90 units.

New York—Sheet metal shops are increasing specifications but are still fabricating more tonnage than they are buying. This means that inventories are being gradually worked off, although sellers believe it will be some time before surplus tonnage is completely eliminated.

Boston—Flat-rolled steel consumers are buying on such short lead-time shortages are narrowly averted if something goes wrong with delivery promises. Bookings for May are somewhat ahead of the April rate, but largely for fill-in sizes and grades with the buying pattern unchanged, namely small orders for prompt shipment. This is emphasized by the small volume taken for June.

Several large consumers of sheets are holding off because of coming product changes. By fall two air-conditioning departments will move and other revised product schedules will mean new specifications. Those in this group are buying only enough steel to finish out requirements.

Hot-rolled strip is notably slow. Converters are drawing on inventory.

Philadelphia—Sheet sellers report a definite pick-up in demand, particularly for cold rolled. The market is far from brisk, but business compared with a month ago is definitely on the upgrade. Cold-rolled sheets for air conditioning units are moving well, although the manufacturing season in this line should be well wound up by end of May. Among the specialties, enameling stock is moving fairly briskly; also high silicon sheets.

Pittsburgh—Orders for hot-rolled sheets are generally dull. Galvanized demand is expected to increase later in second quarter as is that for cold-rolled. Gradual improvement is already noted in sales of cold-rolled.

Cleveland—Some improvement in demand for the flat-rolled products is noted here but buying continues of a cautious nature. Inventory liquidation by consumers is believed pretty well advanced but there is as yet no rush to replenish depleted stocks.

Trade expectations here are that demand will expand somewhat over the next two months, followed by a summer letdown, which in turn will give way to a fall pickup.

Sellers point out that order volume in sheets and strip, while down from last year, has held up substantially better than that in some other products, notably bars, this being explained by the broad use of sheets.

Chicago—Sheetmakers are experiencing a little increased demand from auto builders, giving rise to speculation as to whether there will be a significant bulge in car sales as predicted. Neither does any other consuming field reflect new strength, yet optimism for the future prevails. Strongest demand is in galvanized sheets.

Cincinnati — Offerings under mill prices continue to depress the market in sheets. Warehouses have ample stocks.

St. Louis—Sheet sales continue a mild pickup which promises to put April volume 15 to 20 per cent of that of March. The district's ingot production rate has risen. Granite City Steel Co. boosted its output 25 per cent.

There is no increase in forward ordering. Little tonnage is booked beyond June. But inquiries indicate consumers are wondering if their inventories are not now at the minimum advisable. Demand from farm equipment makers remains good but below last year's normal. Galvanized roofing is excellent.

Steel Bars . . .

Bar Prices, Page 154

Cleveland—Large bar inventories are gradually being liquidated but current buying is only slightly improved. Continued uptrend is expected over remainder of second quarter.

Republic Steel Corp. is issuing new extra cards, dated Apr. 26, covering hot-rolled alloy and special steels, blooms, billets and slabs, bars and spring sizes, and cold-finished alloy steel bars.

These cards contain a complete list of present standard, tentative standard and boron grades, together with applicable grade extras. The new cards reflect the recently announced reduced grade extras for steels containing .15 to .25 molybdenum, together with other minor changes.

Boston—Carbon bar buying is limited to fill-in lots, promptly filled for smaller sizes 2-inch and under, and accounting for the bulk of requirements. Bookings for May are only slightly heavier than in April, and the supply pattern is confused by stock offerings. Alloy volume is supported by potential small arms needs with tonnage for forge shops off.

New York—While cold-drawn bar interests are specifying more freely, hot carbon bar producers report a lag in demand from most other consuming direcitons.

Pittsburgh — Customers, such as appliance manufacturers, continue to reduce inventories. A long, slow process, this results in continued dull sales. Low orders from warehouses contribute to slow conditions here.

Philadelphia—Hot carbon bar sellers are experiencing a limited but sustained volume of demand. Actually there is a pick-up in specifications from cold drawers, who, in turn, are reporting betterment from warehouses and from government agencies.

Sixteen suppliers recently submitted bids on 775 tons of 2-7/16-inch cold drawn bars for the Navy for delivery in May, indicating that while cold drawn business is picking up sellers are after orders and can still offer good delivery promises.

Cincinnati—Stocks of bars are substantial. Some distributors have ex-

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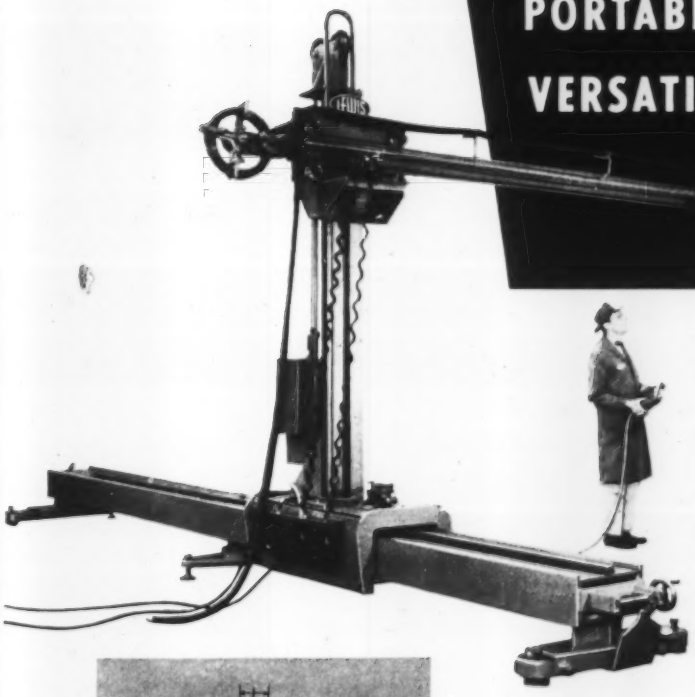

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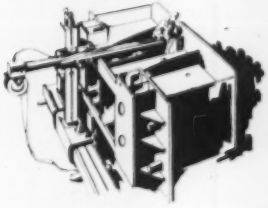

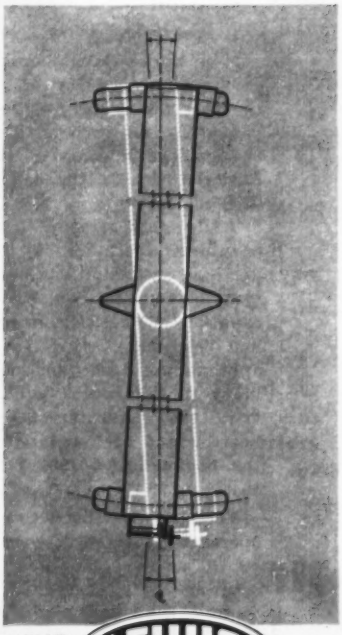

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perienced a pick-up, while others claim demand is no better.

Plates . . .

Plate Prices, Page 154

Boston — So long as fabricating shops can get carbon plates in two to three weeks, consumers display slight interest in building inventory. This applies to tank shops that have registered best improvement in bookings. Orders cover specific tonnage to meet demand of each job and little more.

Demand for floor plates is slow, readily filled from warehouses with ample stocks. Shipbuilding is slack.

New York—Plate sellers report no gain in buying, but believe any shift in trend will be upward, although not pronounced much before early fall.

Philadelphia — Plate business is slow and shows little fluctuation. Most district producers can promise deliveries within a week to two weeks. Encouraging, however, is the fact most fabricators are consuming more tonnage than they are taking in, which means slow but steady reduction in inventories.

Pittsburgh — Construction industries continue to order large quantities of plates, but demand from other quarters is slow.

Seattle—Smaller plate fabricators report an increasing volume of new work. Materials are in easy supply.

Semifinished Steel . . .

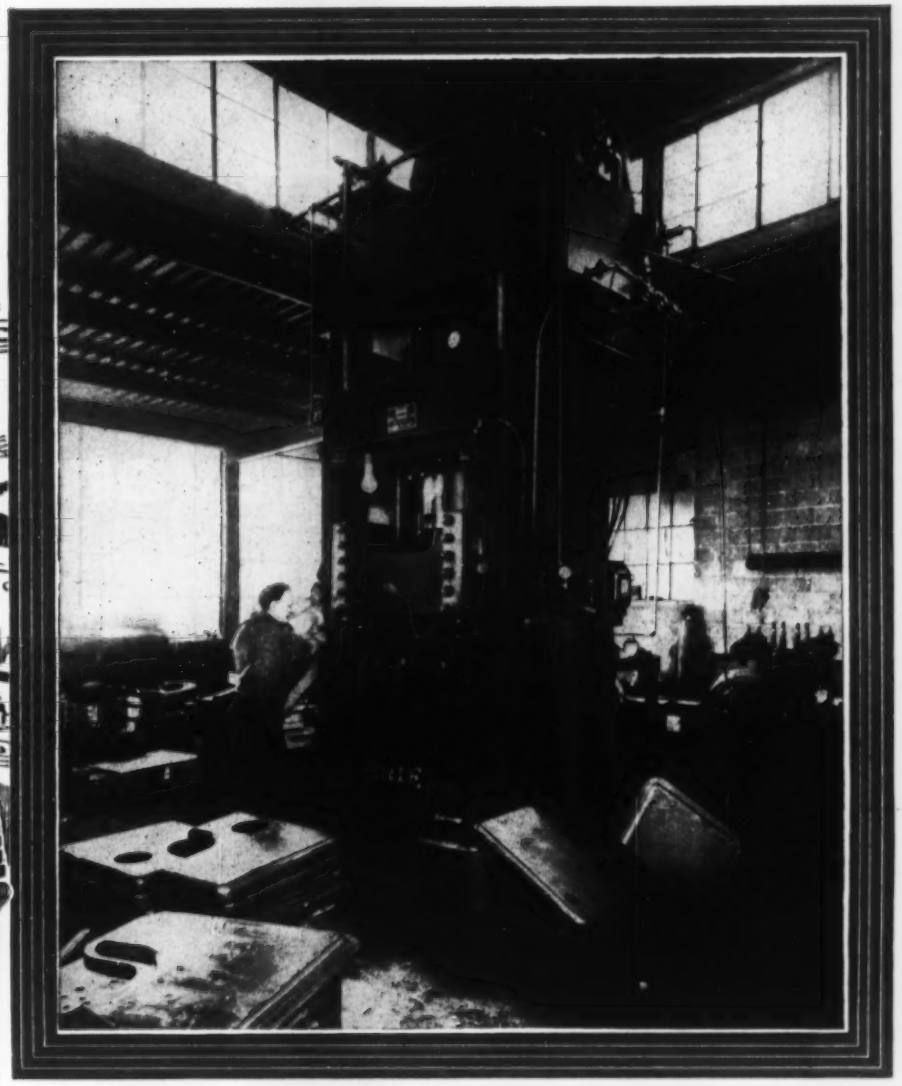
Semifinished Prices, Page 154

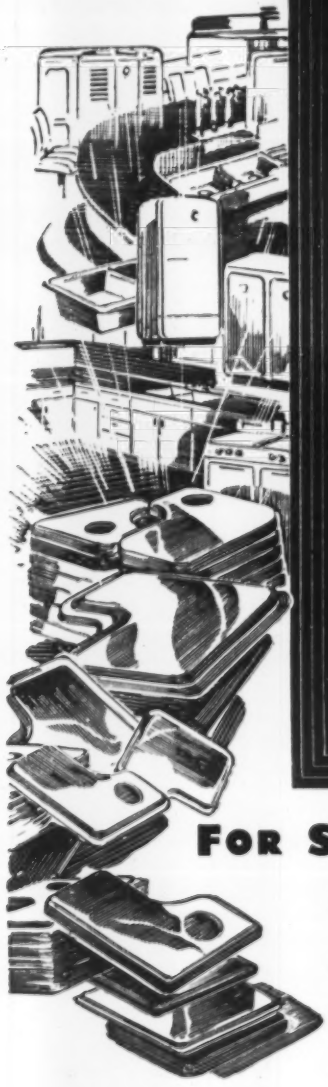
New York—Rapid increase in the steelmaking capacity of the nation the past few years has been accompanied by an even greater rise in the average capacity of steelmaking furnaces, reports the American Iron & Steel Institute.

While total annual capacity of open-hearth furnaces at 109 million net tons on Jan. 1 was nearly 30 per cent higher than in 1945, average capacity of these furnaces per heat had been increased 37 per cent, to approximately 160 tons. Despite the many new furnaces built since the war, the total number of open hearths had been reduced to 934 at the beginning of 1954 from 990 in 1945.

Youngstown—District steelmaking operations last week were increased to 70 per cent of capacity largely as result of improved operations at Youngstown Sheet & Tube Co.'s Campbell Works.

Los Angeles—Kaiser Steel Corp., Fontana Works, banked blast furnaces and open hearths when an un-





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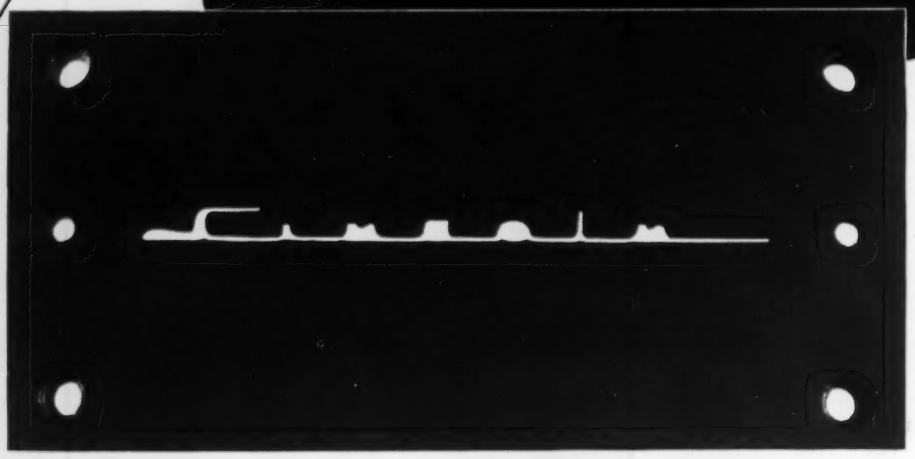

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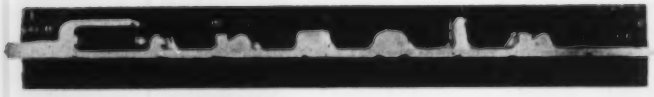

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Wire . . .

Wire Prices, Page 156

Cleveland — Reflecting seasonal pickup in merchant wire demand, Republic Steel Corp. reports sales of finished wire products in first quarter this year doubled those in last quarter of 1953.

J. P. Distler, manager, Wire Division sales, says buying by farmers was primarily responsible for the increase in volume.

Industrial wire demand also is reported showing some improvement. Sluggish business in this area is attributed to inventory correction.

Boston—Heavier orders for furniture spring wire reflect exhaustion of inventories. Bookings are accompanied with delivery pressure. Gradual increase in wire buying in most cases stem from low stocks, although demand for cold heading stock lags.

Wire mill capacity was not filled for April and will not be taken for May, although bookings are running slightly heavier, manufacturers' wire included.

Tin Plate . . .

Tin Plate Prices, Page 156

Washington — Shipments of metal cans in February totaled 260,053 tons, against 264,708 in January and 252,357 in February a year ago. Total for the first two months of 524,761 tons compared with 522,074 in the first two months of 1953.

New York—Dependence of this country on imports of African palm oil has been removed by a discovery stemming from a research project of the American Iron & Steel Institute.

Palm oil is used in producing hot dipped tin plate and in cold rolling some thin sheet and strip. The Institute's research shows specially prepared beef tallow makes an excellent substitute for palm oil for those purposes.

Pittsburgh — Tin mill operations range from 80 to 90 per cent of capacity. While some purchasing by canmakers may be traced to hedging against the possibility of a steel strike, the second quarter is expected to be a peak season for tin plate.

Chicago—Tin plate output is holding strong in keeping with can and container manufacturing operations. Part of the present activity is seasonal.

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Pig Iron . . .

Pig Iron Prices, Page 158

New York—Blast furnace production increased slightly during March as compared with the preceding month but was down sharply as compared with March, 1953, reports the American Iron & Steel Institute.

Output for the month totaled 4,959,303 net tons, of which 4,907,147 tons were pig iron and 52,156 tons ferromanganese and spiegeleisen. In the preceding month production amounted to 4,810,554 tons, divided 4,764,613 tons pig iron, and 45,941 tons ferromanganese and spiegeleisen. In March a year ago output totaled 6,677,361 tons, of which 6,611,040 tons were pig iron and 66,321 ferromanganese and spiegeleisen.

In the first three months this year 15,202,897 tons of pig iron and 146,473 tons of ferromanganese and spiegeleisen were produced. This compares with 18,906,323 tons of pig iron and 216,939 tons of ferromanganese and spiegel in the corresponding three months of last year.

Production by districts in March and the year to date follows:

BLAST FURNACE PRODUCTION
(Net Tons)

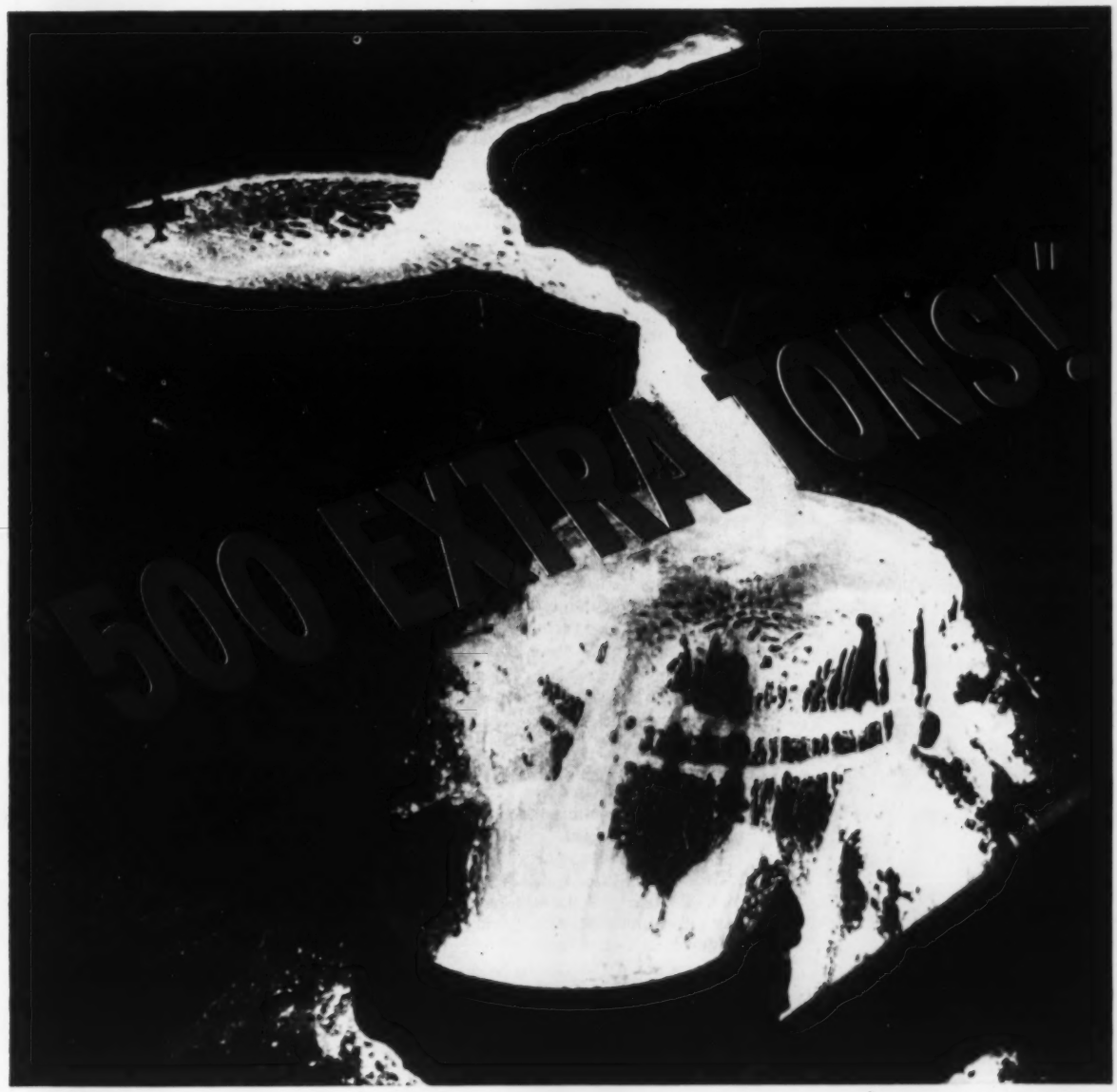
	Pig Iron		Ferromanganese & Spiegel	
District	March	Year to Date	March	Year to Date
Eastern	1,058,943	3,329,307	24,117	59,341
Pittsburgh-Youngstown	1,692,171	5,176,960	23,406	61,976
Cleveland-Detroit	470,452	1,501,032	.....	.....
Chicago	1,053,638	3,257,454	.....	.....
Southern	436,304	1,291,822	4,633	25,156
Western	195,639	646,322	.....	.....
Total	4,907,147	15,202,897	52,156	146,473

New York—Pig iron movement in May is expected to show little variation from the rate of the past two months. Consumer inventories are gradually being reduced, but there will not likely be any spurt in buying unless casting demand picks up.

Philadelphia—Pig iron business continues spotty, with little early change in prospect. Pig iron production has been off the last two or three weeks in this district, but stocks at furnaces continue ample. The Birdsboro, Pa., stack of the Colorado Fuel & Iron Corp. is scheduled to go down for repairs July 1.

Cleveland—Spotty foundry operations are reflected in continued sluggish demand for merchant pig iron. The casting shops are taking in tonnage as needed. With iron available for prompt shipment from the furnaces they are not inclined to worry much about inventories.

Blast furnace operations are curtailed in this area. Last week, however, Republic Steel Corp. relighted



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an idle blast furnace here which has been out of production since Jan. 22.

Production of pig iron in the Detroit-Cleveland area in March registered a slight gain over that of the preceding month but was down sharply from March a year ago. Output for the month was 470,452 tons against 442,654 in February and 732,437 in March, 1953.

Chicago—Pig iron demand varies little from week to week. April volume stacks up about the same as that in March. Gray iron foundries are maintaining low inventories of metallics and fuel, and consequently they are ordering for prompt shipment as casting orders come in.

Iron Ore . . .

Iron Ore Prices, Page 175

New York—East coast seaports and those on the Gulf of Mexico are expanding their iron ore handling facilities to accommodate the increasing flow of imports, reports the American Iron & Steel Institute. At the same time, iron ore ports on the Great Lakes are making their handling facilities more efficient.

More than a dozen salt water ports received imported ore during 1953, but Baltimore, Philadelphia and Mobile accounted for about 80 per cent of the total.

Delaware river ports received a record 1.2 million tons. Mobile, Ala., took in nearly 900,000 tons and expects to handle 3 million tons yearly.

Cleveland—Iron ore is beginning to move down the Great Lakes after the late opening of the 1954 shipping season. To date the movement is only a trickle as compared with recent past years. As of Apr. 26 shipments to lower lake ports totaled only 765,423 tons, reports the Lake Superior Iron Ore Association. This contrasts with 6,891,643 tons moved up to Apr. 26 last year.

Structural Shapes . . .

Structural Shape Prices, Page 154

Boston — Although sniping continues, prices for fabricated structural steel are leveling off. Shops have generally adjusted to 40 hours per week, eliminating overtime. For most projects estimates are competitive. Heavy bridge requirements are ahead, including 50,000 tons, bridges, Massachusetts turnpike.

New York—Structural activity is marking time. Orders are spotty and comprise few outstanding jobs.

Philadelphia — Structural steel activity has tapered off, at least temporarily, although a fair amount of work is actively being figured.

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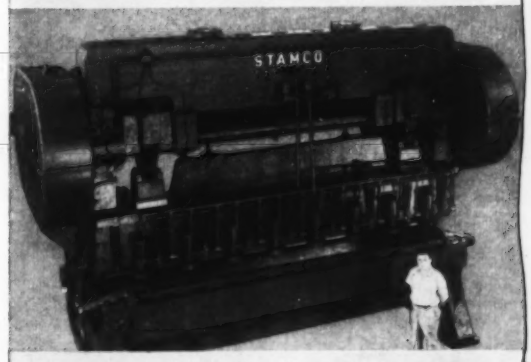

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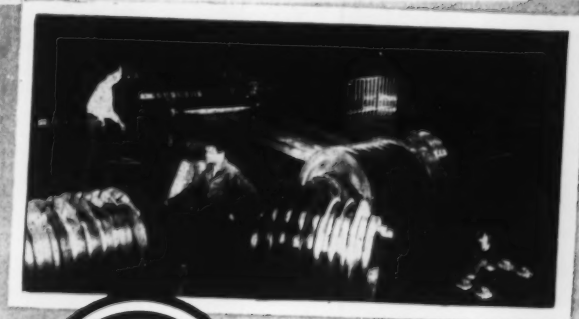

STAMCO 48" Slitting & Coiling Line 15000# coil capacity

STAMCO 72" Heavy Gauge Side Trimming and Slitting Unit equipped with a double set of feed and delivery pinch rolls.

• LAY YOUR SHEARING PROBLEMS AT STAMCO'S DOOR •

STAMCO, Inc., New Bremen, Ohio

CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85% C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Min. carloads, 30c; 2000 lb to min. carloads, 32c; 250 lb to 1999 lb, 34c; less than 250 lb, 37c. Premium for hydrogen-removed metal, 1.5c per lb, f.o.b. cars, Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-85%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed, 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium: Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, C.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 10.8c per pound of contained silicon; 1" x down, bulk 25.25c per pound of contained chromium plus 11c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14; less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max). $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vandium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 10.80c per lb of contained Si, carload packed 12.40c, ton lot 13.85c, less ton 15.5c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 12.2c per pound contained silicon; carload packed 13.55c; ton lots, 14.75c; less ton, 16.1c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.8c per lb of contained Si, carload packed 15.1c, ton lot 16.25c, less ton 17.5c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroborn: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.
Carbortam: (B 1 to 2%) Contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05, less ton 14.95c, Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.3c per lb of briquet. Packed c.l. 7.10c, ton lot 7.9c, less ton 8.8c. Delivered. Spot, add 0.25c.

(Small size—Weighing aprox. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.45c. Packed c.l. 7.25c, ton lot 8.05c, less ton 8.95c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max. C 0.4% max). Contract, ton lot, 2" x D, $9.50 per lb of contained Cb, less ton $9.55. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.o.b, Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c. Packed c.l. 15.50c, ton lots, 15.75c, less ton lots,16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

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Alloymet 2030 (65% Nickel 30% Copper 5% Iron)*

A product of close Metallurgical *CONTROL*
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Regardless of the type of product you make — if you are interested in strength, toughness, uniform structure, resistance to fatigue, long life, lower machining and lower assembly costs — you'll be interested in C Steel Castings. The point is that they are sound, clean, true to pattern castings that by alloy and heat treating possess an almost unlimited range of mechanical properties.

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1101 SOUTH KEDZIE AVENUE • CHICAGO 12, ILLINOIS

ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	20.00
North African hematite (spot)	20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, good commercial quality	23.00-24.00
Domestic scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, $1.02-$1.05 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, $0.95-$0.97.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.:

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$24.00-$26.00
48% no ratio	34.00

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb, Mo content mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$2.40-$2.80
65% min.	$3.40-$3.50

Vanadium Ore

Cents per lb. V_2O_5 content, deld. mills

Domestic	31.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, O., Hays, Pa., $120; Niles, O., $120; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O. $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-$15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld.	28.12
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld	27.58
Lone Star Tex., ovens	18.50
Philadelphia, ovens	23.00
Swedeland, Pa., ovens	23.00
St. Louis, ovens	
St. Louis deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Buffalo, deld.	28.08
Flint, deld.	28.23
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$44-$47
Birmingham area	45.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Diam	Inches Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

JOLIET

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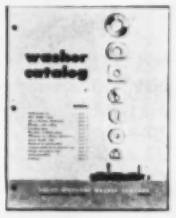

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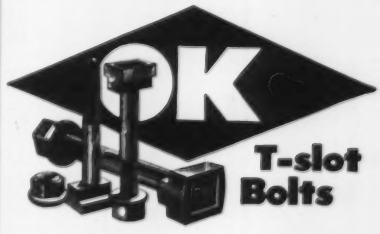

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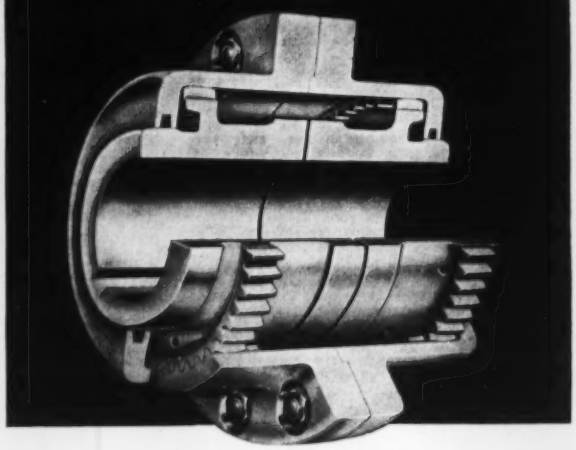

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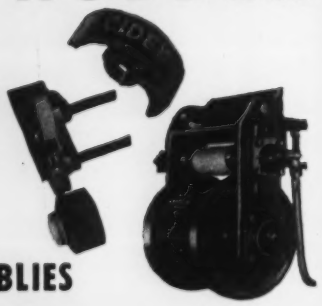

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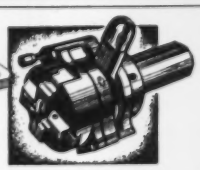

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ARCHITECTURAL GRILLES
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DIAMOND MFG. CO.
BOX 32 WYOMING, PA.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 154

Chicago—A good volume of work keeps coming out in construction lines which promises a busy summer for steel reinforcing items. Suppliers are busy preparing estimates, a chore that always is rough when contractors become highly competitive.

Seattle—Demand for reinforcing bars is stronger. Business of major proportions is expected in the next 90 days. Competition is keen.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2900 tons, nine state highway bridges, Rochester area, Monroe county, New York, to Ernst Iron Works, Buffalo; Lane Construction Corp., Meriden, Conn., general contractor.

950 tons, club house, Y.M.C.A., Milwaukee, to Wisconsin Bridge & Iron Co., Milwaukee; Gebhard Berghammer, Inc., Milwaukee, general contractor.

535 tons, alert hangar and buildings, Dow Airfield Base, Bangor, Me., to American Bridge Division, U. S. Steel Corp., Pittsburgh; John Volpe Construction Co., Malden, Mass., general contractor.

342 tons, state girder bridge, Monroe county, Pennsylvania, to Bethlehem Fabricators, Bethlehem, Pa.

260 tons, bakery, Norristown, Pa., to Anthracite Bridge Co., Scranton, Pa.

225 tons, municipal coliseum, Spokane, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle.

190 tons, Queen Lane pumping station, Philadelphia, to Robertson Steel Co., that city.

105 tons, long span joists, high school, Billerica, Mass., to Bethlehem Steel Co., Bethlehem Pa.; Poorvu Construction Co., Boston, general contractor.

100 tons, prefabricated warehouse for Standard Oil Co. of California's deep water terminal, Seward, Alaska, to Hallidie Machinery Co., Seattle; Valle-Sommers Construction Co., Seattle, general contractor.

100 tons, grain storage, Mansfield, Wash., and miscellaneous contracts, to Isaacson Iron Works, Seattle.

STRUCTURAL STEEL PENDING

2600 tons, Navy armor plate plant, Lukens Steel Co., Coatesville, Pa., Brotherton Construction Co., Harrisburg, Pa., low on general contract.

2300 tons, double cantilever maintenance hanger, Larson Air Field, Moses Lake, Wash.; general contract to Donald M. Drake Co., Portland, Oreg., Bidding $2,215,993, by U. S. Engineer.

520 tons, high school, Woodbridge, N. J., Elizabeth Iron Works, Elizabeth, N. J., low bidder.

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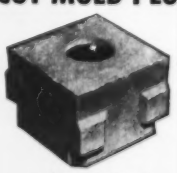
Dunbar, Pa. 4213

COVERED HOT TOP BRICK INGOT MOLD PLUGS



Sales Office
132 S. Whitfield St.
PITTSBURGH 6, PA. EM: 2-0614

430 tons, Gore Air Field hangar, Great Falls, Mont.; Hagstrom Construction Co., St. Paul, low $647,000 on one schedule; James I. Barnes Construction Co., Seattle, low $647,120 on another schedule.

300 tons, state bridge work, Bucks county, Pennsylvania, Langenfelder Contracting Co., Baltimore, low on general contract.

225 tons, state highway bridge, Stamford, Conn.; bids in.

225 tons, state highway bridge, Otsego county, New York; Lane Construction Corp., Meriden, Conn., low, general contract.

135 tons, state highway bridge, Portsmouth-Newington, N. H.; Landers & Griffith Co., Manchester, N. H., low.

100 tons, structurals and bars, state bridge, Isle La Motte, Vt.; bids May 7, Montpelier, Vt.

REINFORCING BARS . . .

REINFORCING BARS PLACED

600 tons, 14-story building, First National Bank, Jackson, Miss., to Ceco Steel Products, Inc., Birmingham; Southeastern Construction Co., Charlotte, S. C., general contractor.

600 tons, grain elevators at Sprague, Spokane and other eastern Washington points, to Northwest Steel Rolling Mills Inc., Seattle; Haynes & Co., Spokane, general contractors.

520 tons, aircraft plant, Sikorsky Division, United Aircraft Corp., Stratford, Conn., to Concrete Steel Co., New York; E. & F. Construction Co., Bridgeport, Conn., general contractor.

470 tons, high school, Billerica, Mass., to Concrete Steel Co., Boston; Poorvu Construction Co., Boston, general contractor.

460 tons, club house, Y.M.C.A., Milwaukee, to Concrete Steel Co., Chicago; Gebhard Berghammer, Inc., Milwaukee, general contractor.

125 tons, piping, etc., Elelson Air Force Base, Alaska, to Northwest Steel Rolling Mills Inc., Seattle; Reed & Martin, Fairbanks, Alaska, general contractors.

120 tons, state training school, Boulder, Mont., to Bethlehem Pacific Coast Steel Corp., Seattle.

100 tons, bulk fuel storage and facilities, airfield base, Portsmouth, N. H., to Joseph T. Ryerson & Son, Inc., Cambridge, Mass.; J. F. McGlame Co., Brookline, Mass., general contractor.

REINFORCING BARS PENDING

300 tons, state highway girder spans, Lewis county, Washington; bids to Olympia, Wash., May 11.

PLATES . . .

PLATES PLACED

100 tons or more, airfield base fueling storage tanks, Portsmouth, N. H., to Chicago Bridge & Iron Co., Chicago; F. J. McGlame Co., Brookline, Mass., general contractor.

PIPE . . .

CAST IRON PIPE PENDING

500 tons, (estimated) 34,000 feet 16 to 6-inch; bids to George E. Fisher, city engineer, Pasco, Wash., May 4.

100 tons, 16 to 6 inch, bids in to Puyallup and Wenatchee, Wash.

RAILS, CARS . . .

RAILROAD CARS PLACED

Aliquippa & Southern, 42 one-hundred-ton gondola cars, to own shops.

Chicago & Eastern Illinois, 10 fifty-ton box cars, to Pullman-Standard Car Mfg. Co., Chicago.

Fruit Growers Express Co., 100 seventy-ton mechanical refrigerator cars, to its own shops.

Missouri-Kansas-Texas, one 72-passenger stainless steel coach to Pullman-Standard Car Mfg. Co., Chicago.

Missouri Pacific, 35 fifty-ton flat cars, to its De Soto, Mo., shops.

Union Pacific, 100 covered hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

The Gripco Lock Nut one-piece design gives a tighter more positive holding action for faster application at less cost. And for 50 years the Gripco locking feature has proven itself by an ever increasing use. All-one-piece to cut initial cost—(no inserts, outside devices or complicated features) — the extreme holding or locking action is produced by a simple, vertical thread deflection. For stress, wear or vibration, a Gripco Lock Nut will hold tighter, wear longer. Impervious to oil or water. Write for samples and full details.

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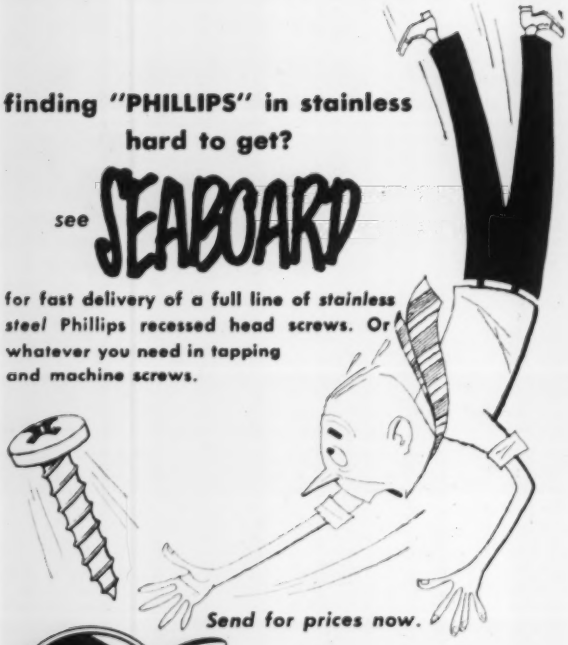

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ALL TYPES

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THE COLOR TELLS THE THICKNESS

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Scrap Firmer Despite Sluggish Demand

Prices rise at some consuming points but generally the market is steady with buying of dealer grades in a rut. Pickup in demand during May and June expected

Scrap Prices, Page 180

New York—Brokers have boosted their buying prices $1 per ton on the major open-hearth grades, now offering $15 for No. 1 heavy melting and No. 1 bundles, $13 for No. 2 heavy melting and $11 for No. 2 bundles. Strength is derived primarily from a better tone in certain other areas rather than from any particular improvement in demand among consumers drawing on this district. Actually, these advances are nominal.

Short shovel turnings are higher at $9 to $10, based on moderate buying. Low phos is steady at $20, and machine shop turnings and mixed borings and short turnings are nominally unchanged. No. 1 cupola cast is firm at $29 to $30. Demand for 18-8 stainless sheets, clips and solids is stronger with the market higher at $165 to $170. Other stainless items are quiet and unchanged.

Philadelphia—The steel scrap market here continues in a rut. While prices are unchanged, trading is at virtual standstill and traders see little activity in early prospect. This applies not only to the open-hearth grades, but to low phos scrap and mixed borings and turnings. Rail specialties are moving slowly although there is a fair undertone of strength, and in the cast grades the price trend is a bit mixed. No. 1 cupola is higher at $36, delivered consumer plant, while heavy breakable cast is off a bit at $36.50.

Boston—Recovery in steel scrap prices centers mostly in No. 2 heavy melting steel and No. 2 bundles, although primary grades are somewhat firmer. Freight rates to the larger consuming points still tend to retard volume of No. 1 grades at current shipping base prices. Volume of cast is small but with prices unchanged.

Youngstown—Stronger tone is developing in the scrap market here although relatively little buying is in evidence. One fabricating concern sold No. 1 bundles recently at $30 per gross ton, which is considerably above the nominal quotation of $26 to $27 heretofore generally recognized as the market in the absence of dealer sales. No. 2 is reported at $24 to $25.

Steel plants in this area are generating almost enough scrap in their own operations to meet their current requirements. One producer reports scrap from its operations in February exceeded its requirements by 8000 tons.

Chicago — Scrap prices have held fairly steady the past 10 days following their upward swell prior to that. One advance is $1 on No. 1 factory bundles to $31.

Whether scrap has returned to a reasonable economic level pricewise at which it could more or less stabilize for a while is a moot question. There is no significant change in demand with the steel mills operating slightly below 80 per cent of capacity.

Cast grades show some signs of weakening as foundries continue to operate spottily.

Buffalo—Stronger tendencies dominate the scrap market here. One of the leading mills lifted its embargo on orders placed in the last quarter of 1953 at prices sharply above current levels. On the bullish side also is an unfilled inquiry for No. 1 heavy melting steel for shipment at prices above current levels. Activity also is reported in cast grades. Both cupola and No. 1 machinery are in demand.

Detroit — Scrap prices advanced slightly here last week as automotive lists closed. Major impetus is reported in Chicago with scrap going from Detroit to that city by boat and rail. Heavy inventories of most Detroit area steel producers create some question as to the duration of the price movement.

St. Louis — Scrap prices have strengthened mildly and selectively under buying by consumers whose stocks had reached an extreme low. Turnings gained about $1 and some rail items $2. Dealers yard receipts of melting steel are so scant there would be a general scarcity were it not for continuing high railroad offerings.

Cincinnati — Strength is apparent throughout the list. Cast iron grades made the greatest show of force with increases of $2 to $3 a ton. Charging box cast and heavy breakable cast moved up $3 a ton to $34. No. 1 cupola climbed $2 to $38 and drop broken machinery advanced a similar amount to $44. A shortage of supply and increased demand are the factors

(*Please turn to page* 182)

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IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

April 29	$26.00
April 22	26.00
Mar. Avg.	24.37
Apr. 1953	42.88
Apr. 1949	24.06

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	26.00-27.00
No. 2 bundles	22.00-23.00
No. 1 busheling	26.00-27.00
Machine shop turnings	14.00-15.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings	18.00-19.00
Cast iron borings	18.00-19.00
Cut structurals	29.00-30.00
Heavy turnings	26.00-27.00
Punchings & plate scrap	30.00-31.00
Electric furnace bundles	30.00-31.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Charging box cast	33.00-34.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	24.00-25.00
No. 1 machinery cast	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	*29.00-30.00*
Rails, 2-ft. and under	44.00-45.00
Rails, 18-in. and under	45.00-46.00
Rails, random lengths	38.00-39.00
Railroad specialties	34.00-35.00

Stainless Steel Scrap
(F.o.b. shipping point)

18-8 bundles & solids	165.00-170.00
18-8 turnings	85.00-90.00
430 bundles & solids	65.00-70.00
430 turnings	50.00-52.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	*25.00-26.00*
No. 2 heavy melting	*21.00-22.00*
No. 1 bundles	*25.00-26.00*
No. 2 bundles	*18.00-19.00*
No. 1 busheling	*25.00-26.00*
Machine shop turnings	*11.00-12.00*
Mixed borings, turnings	*15.50-16.50*
Short shovel turnings	*15.50-16.50*
Cast iron borings	*15.50-16.50*
Low phos.	*26.00-27.00*
Alloy free, short shovel turnings	*15.50-16.50*
Electric furnace bundles	*25.00-26.00*

Cast Iron Grades

No. 1 cupola	*40.00-41.00*
Charging box cast	*26.50-27.50*
Stove plate	*36.50-37.50*
Heavy breakable cast	*25.50-26.50*
Unstripped motor blocks	*24.50-25.50*
Brake shoes	*30.50-31.50*
Clean auto cast	*41.50-42.50*
No. 1 wheels	*33.50-34.50*
Burnt cast	*31.50-32.50*
Drop broken machinery	*41.50-42.50*

Railroad Scrap

No. 1 R.R. heavy melt.	*30.00-31.00*
R.R. malleable	*40.00-41.00*
Rails, 2-ft. and under	*43.00-44.00*
Rails, 18 in. and under	*46.00-47.00*
Rails, random lengths	*39.00-40.00*
Cast steel	*34.00-35.00*
Railroad specialties	*35.00-36.00*
Uncut tires	*36.00-37.00*
Angles, splice bars	*41.00-42.00*
Rails, rerolling	*41.00-42.00*

Stainless Steel
(F.o.b. shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	*28.00-29.00*
No. 2 heavy melting	*23.00-24.00*
No. 1 bundles	*28.00-29.00*
No. 2 bundles	*21.00-22.00*
Machine shop turnings	*12.00-13.00*
Short shovel turnings	*18.00-19.00*
Cast iron borings	*18.00-19.00*
Low phos.	*29.00-30.00*
Electric furnace bundles	*28.00-29.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*30.00-31.00*

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	22.00
No. 2 heavy melting	20.00
No. 1 bundles	22.00
No. 2 bundles	18.00
No. 1 busheling	22.00*
Electric furnace bundles	23.00-23.50
Machine shop turnings	11.00
Mixed borings, turnings	12.00
Short shovel turnings	16.00*
Structurals & plate	26.00-27.00
Heavy turnings	20.00
Couplers, springs, wheels	30.00
Rail crops, 2 ft & under	41.00

Cast Iron Grades

No. 1 cupola	*36.00*
Malleable	39.00
Heavy breakable cast	*36.50*
Unstripped motor blocks	28.00*
Drop broken machinery	41.00

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*15.00*
No. 2 heavy melting	*13.00*
No. 1 bundles	*15.00*
No. 2 bundles	*11.00*
Machine shop turnings	4.00*
Mixed borings, short turnings	6.00*
Los phos. (structural & plate)	20.00
Short shovel turnings	*9.00-10.00*

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	21.00-22.00*

Stainless Steel

18-8 sheets, clips, solids	*165.00-170.00*
18-8 borings, turnings	70.00-75.00
430 sheets, clips, solids	40.00
410 sheets, clips, solids	30.00

*Nominal.

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	14.00-16.00
No. 2 heavy melting	*12.25-13.25*
No. 1 bundles	*14.50-15.00*
No. 2 bundles	*11.00-11.25*
Machine shop turnings	3.00-3.50
Mixed borings, turnings	5.50-6.00
Short shovel turnings	7.25-7.50
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	36.00-37.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	23.00-24.00
No. 2 heavy melting	20.00-21.00
No. 1 bundles	23.00-24.00
No. 2 bundles	18.00-19.00
No. 1 busheling	23.00-24.00
Machine shop turnings	10.00-11.00
Mixed borings, turnings	11.00-11.50
Short shovel turnings	13.00-14.00
Cast iron borings	11.00-11.50
Low phos., 18-in.	*32.00-33.00*

Cast Iron Grades

No. 1 cupola	*38.00*
Heavy breakable cast	*34.00*
Charging box cast	*34.00*
Drop broken machinery	*44.00*

Railroad Scrap

No. 1 R.R., heavy melt.	28.00-29.00
Malleable	32.00-33.00
Rails, 18-in. and under	*43.00-44.00*
Rails, random lengths	*35.00-36.00*

CHICAGO

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	27.00-28.00
No. 1 factory bundles	*30.00-31.00*
No. 1 dealer bundles	28.00-29.00
No. 2 bundles	22.00-23.00
No. 1 busheling	29.00-30.00
Machine shop turnings	13.00-14.00
Mixed borings, turnings	13.00-14.00
Short shovel turnings	15.00-16.00
Cast iron borings	15.00-16.00
Cut structurals, 3-ft	32.00-33.00
Punchings & plate scrap	32.00-33.00
Electric furnace bundles	*31.00-32.00*

Cast Iron Grades

No. 1 cupola	38.00-39.00
Stove plate	34.00-36.00
Unstripped motor blocks	24.00-25.00
Clean auto cast	40.00-42.00
Drop broken machinery	41.00-42.00

Railroad Scrap

No. 1 R.R., heavy melt.	*31.00-32.00*
R.R. malleable	40.00-42.00
Rails, 2-ft. and under	*44.00-45.00*
Rails, 18-in. and under	*45.00-46.00*
Angles, splice bars	36.00-38.00
Rails, rerolling	39.00-40.00

Stainless Steel Scrap

18-8 clips & solids	130.00-140.00
18-8 turnings	60.00
430 clips & solids	40.00-42.00
430 turnings	20.00-22.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*18.00*
No. 2 heavy melting	*16.00*
No. 1 bundles	*19.50*
No. 2 bundles	*16.50*
No. 1 busheling	*19.50*
Machine shop turnings	*7.00*
Mixed borings, turnings	*7.00*
Short shovel turnings	*9.00*
Punchings & plate scrap	*22.00*

Cast Iron Grades

No. 1 cupola	36.00
Charging box cast	*27.00*
Stove plate	*29.00*
Heavy breakable	*26.00*
Unstripped motor blocks	18.00
Clean auto cast	40.00
Malleable	28.00

BUFFALO

No. 1 heavy melting	*25.00-26.00*
No. 2 heavy melting	19.50-20.50
No. 1 bundles	*25.00-26.00*
No. 2 bundles	17.50-18.50
No. 1 busheling	20.50-21.50
Machine shop turnings	14.00-15.00
Mixed borings, turnings	16.50-17.00
Short shovel turnings	17.50-18.00
Cast iron borings	16.50-17.00
Low phos.	27.50-28.50

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	34.00-35.00
No. 1 machinery	37.00-38.00

Railroad Scrap

Rails, random lengths	33.00-34.00
Rails, 3-ft and under	40.00-41.00
Railroad specialties	34.50-35.50

BIRMINGHAM

No. 1 heavy melting	19.00-20.00
No. 2 heavy melting	17.00-18.00
No. 1 bundles	19.00-20.00
No. 2 bundles	15.00-16.00
No. 1 busheling	19.00-20.00
Cast iron borings	13.00-14.00
Short shovel turnings	14.00-15.00
Machine shop turnings	12.00-13.00
Electric furnace bundles	25.00-26.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	39.00-40.00
Charging box cast	28.00-29.00
Stove plate	36.00-37.00
Bar crops and plate	28.00-29.00
Structural, plate 2 ft	28.00-29.00
Heavy breakable cast	28.00-29.00
Unstripped motor blocks	32.00-33.00
No. 1 wheels	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	23.00-24.00
Rails, 18 in. and under	39.00-40.00
Rails, random lengths	32.00-33.00
Angles, splice bars	35.00-36.00
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	25.50
No. 2 heavy melting	24.50
No. 1 bundles	25.50
No. 2 bundles	19.00-20.00
Machine shop turnings	*12.00*
Short shovel turnings	*14.00*

Cast Iron Grades

No. 1 cupola	37.00
Charging box cast	27.00
Heavy breakable cast	27.00
Unstripped motor blocks	27.00
Brake shoes	30.00
Clean auto cast	39.00
Stove plate	*30.00*

Railroad Scrap

No. 1 R.R. heavy melt.	29.00
Rails, 18-in. and under	*40.00*
Rails, random lengths	*36.00*
Rails, rerolling	*39.00*
Uncut tires	30.00
Angles, splice bars	33.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	23.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	16.00
No. 3 bundles	13.00
Machine shop turnings	11.50
Mixed borings, turnings	11.50
Short shovel turnings	11.50
Electric furnace, No. 1	35.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	30.00-35.00
Heavy breakable cast	25.00
Unstripped motor blocks	23.00
No. 1 wheels	21.00
Stove plate (f.o.b. plant)	28.00
Brake shoes	28.00

Railroad Scrap
(Delivered consumer plant)

Rails, random lengths	30.00-34.00

SAN FRANCISCO

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 1 busheling	20.00
Machine shop turnings	5.00
Mixed borings, turnings	5.00
Short shovel turnings	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	39.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

LOS ANGELES

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	18.00
No. 2 bundles	14.00
Machine shop turnings	5.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	40.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting	$22.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	17.00
Mixed steel scrap	16.00
Mixed borings, turnings	12.00
Rails, remelting	32.00
Busheling, new factory: Prepared	20.00
Unprepared	16.00
Short steel turnings	12.00

Cast Iron Grades†

No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.

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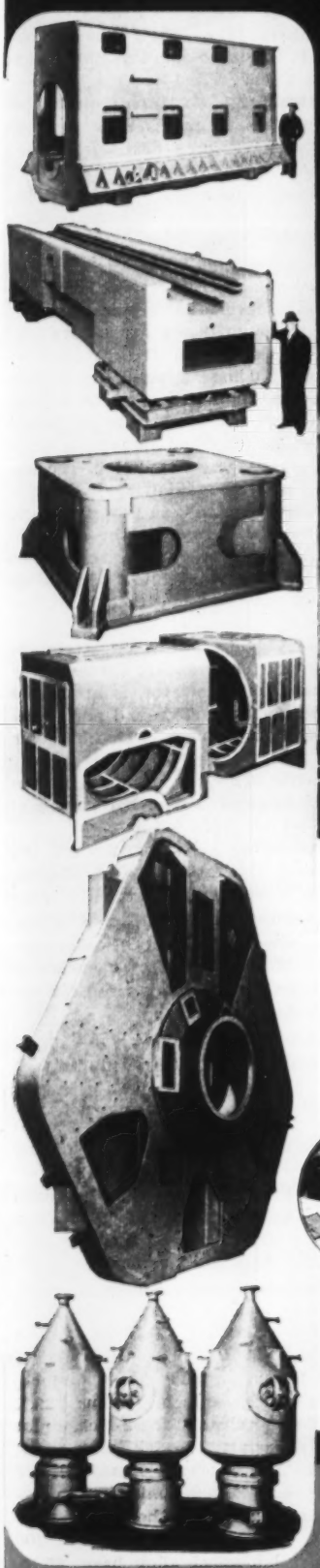

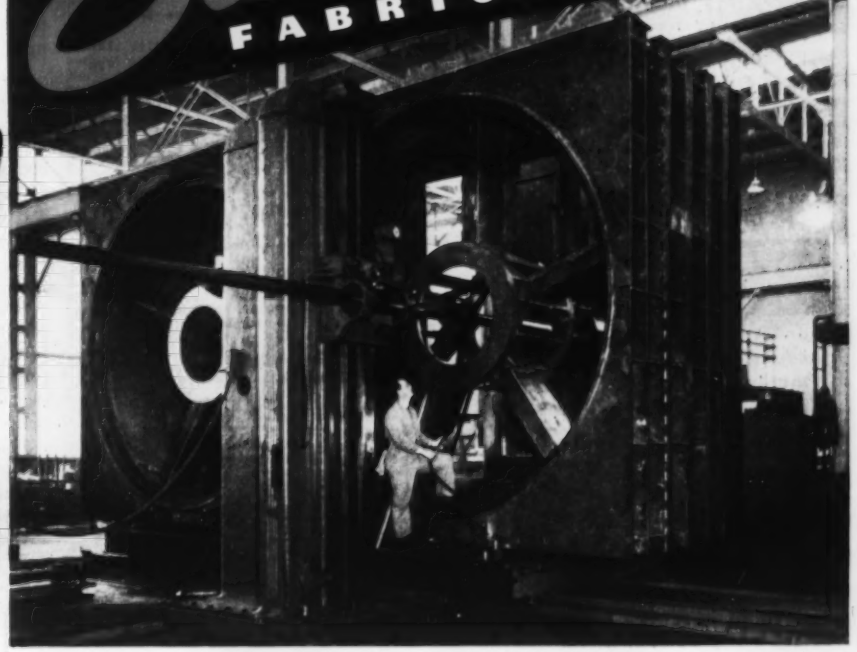

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behind the rises. Low phosphorous rose $1 to $32 to $33. Rails also went up $1 a ton.

Pittsburgh — Scattered purchases of open-hearth grades were reported last week. Volume of ordering was not sufficient to raise prices, but present quotations are stable. Some dealers expect prices on better grades to increase slightly next week. As yet mills plan no major purchases.

Cleveland—Stronger sentiment continues to develop in the scrap market here although dealer grades are still moving slowly. On the strength of broker bidding against production lists now coming out prices are up another $1 per ton on the steelmaking grades. Current quotations, however, are largely nominal in the absence of active mill buying.

Birmingham—There is virtually no market for scrap in this section. What few orders there are present some difficulty in filling because of lack of offerings due to current low prices.

Los Angeles—Prices on steelmaking grades of scrap are firming. The stronger tone, however, is attributed to speculative factors and not to renewed mill demand, which remains dull.

Seattle—The scrap market continues sluggish, strength reported in the East not being felt here.

Washington — Committee of the National Federation of Independent Scrap Yard Dealers recently conferred here with Dr. Arthur S. Flemming, director of the Office of Defense Mobilization, to consider a formula for stockpiling scrap for national defense.

Announce New Export Prices

New York — New export prices have been announced on several products by the United States Steel Export Co., subsidiary of U. S. Steel Corp. The new prices were put into effect Apr. 22 and include freight to New York, Philadelphia and Baltimore. They are as follows:

American Standard Pipe, T & C, seamless black: 2-inches, minus 10.115 per cent discount; 2½-inch, minus 14.115; 3-inch, minus 16.615; 3½ and 4-inch, minus 20.95; 5-inch, minus 20.2; 6-inch, minus 22.7. Seamless galvanized: 2-inch, plus 4.885 discount; 2½-inch, plus 2.635; 3-inch, plus 0.135; 3½ and 4-inch, minus 4.2; 5-inch, minus 3.45; 6-inch, minus 5.95. Other new prices are: Wire rods, $4.71 per 100 pounds; hot-rolled alloy bars, $5.10, and cold-drawn alloy bars, $6.55.

...if only for THEIR sakes

...learn how to protect yourself from death from cancer. They need *you!*

And for your sake and theirs you must keep on remembering that the best cancer "insurance" is:

FIRST...*to make a habit of periodic health check-ups no matter how well you may feel, always including a thorough examination of the skin, mouth, lungs and rectum and (for women) the breasts and generative tract.*

SECOND...*to learn the seven danger signals that may mean cancer, and go straight to the doctor at the first sign of any one of them—(1) Any sore that does not heal (2) A lump or thickening, in the breast or elsewhere (3) Unusual bleeding or discharge (4) Any change in a wart or mole (5) Persistent indigestion or difficulty in swallowing (6) Persistent hoarseness or cough (7) Any change in normal bowel habits.*

For other life saving facts about cancer, phone the American Cancer Society office nearest you, or address your letter to "Cancer"—in care of your local Post Office.

American Cancer Society

CLASSIFIED

Accounts Wanted

DIRECT REPRESENTATIONS WANTED! Established manufacturers agency contacting steel mills, fabricators and miscellaneous industrials in eastern Middle Atlantic area increasing sales force and wants to add one or two live lines. Reply Box 960, STEEL, Penton Building, Cleveland 13, Ohio.

STEEL MILL REPRESENTATIVE with engineering and manufacturing background covering North and South Carolina and Eastern Tennessee desires to represent mills producing cold rolled sheet and strip. Will also consider representing producers of cold formed shapes and moldings, perforated metals and other related products. Reply Box 964, STEEL, Penton Building, Cleveland 13, Ohio.

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PLANT MANAGER—M.I.T. Engineering Graduate with Proven Record in Supervision, Production, Tooling, Cost Reduction, Methods Improvement and Related Functions. Reply Box 949, STEEL, Penton Building, Cleveland 13, Ohio.

Employment Service

SALARIED POSITIONS $5,000 to $35,000. We offer the original personal employment service (established 44 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC., 665 Brisbane Bldg., Buffalo 3, N.Y.

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Use the "Help Wanted" columns of STEEL. Your advertisement in STEEL will put you in touch with qualified, high-calibre men who have had wide training in the various branches of the Metal Producing and Metalworking industries.

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They're made for you

Punches and Dies

Ever need punches and dies *fast*? We have them waiting for you.

In stock for immediate shipment are 76 types of punches and 65 types of dies in a large range of round, oval, flat, and square sizes to fit most makes of presses.

For the few punch presses our tools don't fit, we will gladly quote on making holders to take standard punches and dies with their repeated saving of time and money.

Cutters

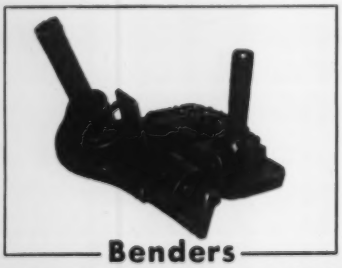
Our hand operated bench type cutters are made in three handy sizes. By simply changing blades you can cut angles, channels, flat bars, rods, and wire rope.

And, besides being versatile, these cutters are built to keep doing the job for you year after year.

Punches

Our Front Lever Bench Punches were designed to fill the need for a small, hand operated punch that would not only stand up under constant use but would also hold the punch and die in true alignment at all times.

Capacity: 7/16" hole through ¼" steel or equivalent. Weight: 70 lbs.



Benders

Our Fisher Bender (also known as Metal Lathers' Bender) is used in many trades because of its ease of operation and durability. It will bend ½" square or round iron, 2" x ½" channel iron, 2¼" x 5/16" flat iron cold. Weight 40 lbs.

Send for catalog sheets giving full information on our tools—including prices.

T. H. LEWTHWAITE MACHINE CO.

310 EAST 47th STREET, NEW YORK 17, N.Y.

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Farval saves 50 minutes of each lubricating hour on Clearing press

FARVAL—*Studies in Centralized Lubrication*
No. 150

GOOD news for cost-conscious management! Lubrication studies show that Farval saves 50 minutes out of every hour of oiling labor.

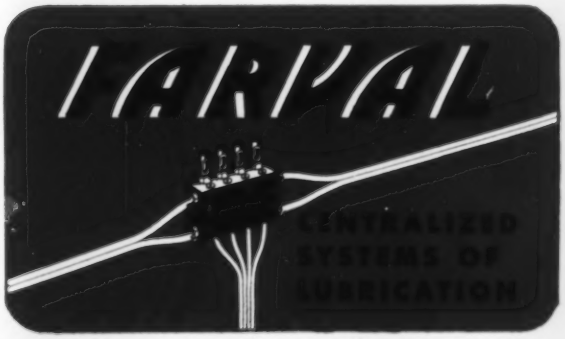
In a lubrication study of this Clearing press, hand-oilers were clocked with a grease gun as they lubricated, cleaned nipples, refilled gun, climbed and traveled from point to point. Averages show that it takes .747 minutes of labor per point to do all this. Thus, to grease this 41-point press by hand once per shift would take a little over 30 minutes. That's one hour a day based on a two-shift day.

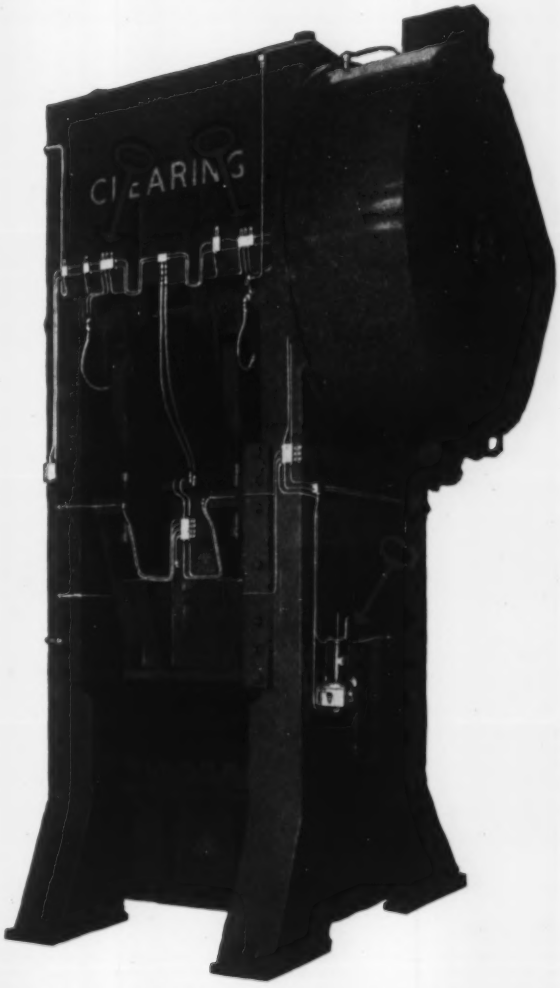
Now, look at Farval. Experience shows that it takes only .188 minutes of labor per point to build up and hold pressure and lubricate. On the same basis, Farval lubrication takes a little over 10 minutes per two-shift day. This includes time for filling the Farval reservoir once every 5 days. In other words, Farval saves 50 minutes out of every hour of oiling labor! With larger Farval systems and with more points per press, the time savings are even greater.

Farval is the original Dualine system of centralized lubrication that delivers oil or grease under pressure to a group of bearings from one central station, in exact quantities, as often as desired. The Farval valve has only two moving parts—is simple, sure and foolproof, without springs, ball-checks or pinhole ports to cause trouble. Indicators at every bearing show that each valve has functioned.

Get full information on the Farval system of centralized lubrication by writing today for new Bulletin 26. The savings possible in your own plant will surprise you! The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.





KEYS TO ADEQUATE LUBRICATION—Wherever you see the sign of Farval—the familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated. Farval manually operated and automatic systems protect millions of industrial bearings.

The 310-ton Clearing press shown above is installed in a well-known automobile plant in Michigan. You can see the major part of the Farval manual system—valve manifolds, lubricant lines and manual pumping unit. Within seconds and without moving from the central pumping station, one man can lubricate all 41 points.

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